GB106

Service Manual

LG Electronics

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1. INTRODUCTION

Purpose

This manual provides information necessary to repair, description and download the features of this model.

1.2 Regulatory Information

A. Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part(for example , persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges for your telecommunications services. system users are responsible for the security of own system. There are may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use .The manufacturer dose not warrant that this product is immune from the above case but will prevent unauthorized use of common-carrier telecommunications service of facilities accessed through or connected to it.
The manufacturer will not be responsible for any charges that result from such unauthorized use.

B. Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

C. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the this phone or compatibility with the network, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

D. Maintenance Limitations

Maintenance limitations on this model must be performed only by the manufacturer or its authorized agent . The user may not make any changes and/or repairs expect as specifically noted in this manual. Therefore, note that authorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

E. Notice of Radiated Emissions

This model complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

F. Pictures

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

G. Interference and Attenuation

Phone may interfere with sensitive laboratory equipment, medical equipment, etc. Interference from unsuppressed engines or electric motors may cause problems.

H. Electrostatic Sensitive Devices

ATTENTION

Boards, which contain Electrostatic Sensitive Devices(ESD),are indicated **by the sign .**

Following information is ESD handing:

. Service personnel should ground themselves by using a wrist strap when exchange system boards.

. When repairs are made to a system board , they should spread the floor with anti-static mat which is also grounded .

. Use a suitable, grounded soldering iron .

. Keep sensitive parts in these protective packages until these are used.

. When returning system boards or parts like EEPROM to the factory, use the protective packages as described.

2. PERFORMANCE

H/W Features

Item	Specifications	etc
Solution	EGOLD voice PMB7880 (ULC2)	Infineon
pe	Bar type	
Antenna Type	Internal (dual-Band)	
Main Display	1.5” 128x128 CSTN/65k	
Battery	950mAh Li-ion inner pack	950mAh: 55x34x50mm
Audio player	MIDI ring tone, 16poly	MIDI ring tone
Loud Speaker	Yes	
Memory Size	32Mb+4Mb	No user memory
LMT (Lost Mobile Tracker)	Yes	
Weight	70g	
Vibrator	Shall support in built vibration alert	
SIM Card	Shall support SIM card both 1.8V and 3V.	
KEY Back Light	Yes	
KEY Back Light color	Blue	
Frequency	850 MHz/class 4 (2W)	850/1900 (GB100a, GB105a)
	900 MHz/class 4 (2W)	900/1800 (GB100, GB100b,GB105, GB105b,GB106)
	1800 MHz/class 1 (1W)	900/1800 (GB100, GB100b,GB105, GB105b,Gb106)
	1900 MHz/class 1 (1W)	850/1900 (GB100a, GB105a)
Standby Time	Shall support minimum test minutes as [min] based on battery capacity of [mAh]	↑ 440 hrs & ↓ 2.1mA @ 950mAh (P.P.: 5)
Talk Time	Shall support minimum test hours as [hrs] based on battery capacity of [mAh]	↑ 6 hrs30min@950mAh (PCL: 10) (Talk time = 95% Capacity / Talk current)
RTC	The real time clock shall be able to sustain for at least [#hrs] after removing the battery.	LGE confirm to put 22uf capacitor for RTC backup time

S/W Features

Feature	Detail Item	Description	
OS	OSE	Operating System	Y
Audio	Speech Code	FR,EFR,HR,AMR-NB	Y
	AMR code	GSM Full Rate 3GPP Adaptive Multi Rate (AMR-NB)	Y
	FM Radio	Only GB105,GB105a,GB105b,GB106,Gb107,GB107a,GB107b (GB 106 : FM internal antenna)	Y
	MP3 Ring Tone	MP3 decode	N
	Integrated hands free speaker	Speaker phone mode	Y
	Key Tone Volume	6 Level (Include Mute)	Y
	Ring Tone Volume	6 Level (Include Mute)	Y
	Ring Tone	10 Midi	Y
	Call Alert type	Ring, Vibrate, Ring & Vibrate, Ring after vibrate, Silent	Y
	Earpiece Volume	6 Level (Include Mute)	Y
	Mute		Y
Frequency Bands	GSM dual band MS 900-1800		N
	PCS dual band MS 850-1900	Configuration is during software compile time.	Y
Date Service	Circuit		N
	Packet		N
Connectivity	Infrared (IrDA)		N
	Bluetooth		N
	USB		N
	USB Mass storage		N
	RS232(UART)	Only for Phone tool & download	Y
Voice Function	Voice Recording		N
	Voice Command		N
	Answering machine		N
Display	RSSI	6 level (0~5Level)	Y
	Battery level	4 level (0~3Level)	Y
	RTC	Date & Time Display	Y
	PLMN/Service Indicator		Y
	Quick Access Mode In Idle	Profile/ SMS + Voice Mail	Y

	Dimming Clock		N
	Dual Clock		N
	Home shortcut	Display Shortcut icon in Idle	Y
Call History	Last Dial Number	Max : 20 records	Y
	Last Received Number	Max : 20 records	Y
	Last Missed Number	Max : 20 records	Y
	Scratch Pad Memory		N
	Call Duration	Last Call time, Total Call Time	Y
Call Cost	Last Call Charge Units		N
	Total Charge Units		N
Call Management	Call Waiting		Y
	Call Swap		Y
	Call Retrieve		Y
	Auto Answer		Y
	Auto Redial		Y
	Calling Line		Y
	Full Call Divert		Y
	Speed Dialing		Y
	Last Number Redial		Y
	Multi Party Call		Y
	ECT	Explicit Call Transfer (4 + Send)	Y
Network	Automatic Network Selection		Y
	Manual Network		Y
	Preferred Network		Y
	Network Service Status		Y
DTMF	DTMF Signaling		Y
	DTMF Enable & Disable		Y
Cell Broadcast	Read Cell Broadcast		Y
	On/Off setting	Receive On/Off	Y
	Alert setting		Y
	Language setting		Y
	Topics Setting		Y
Contacts(Phone Book)	Entry	Phone 300 + SIM	Y
	Field	Name, Mobile, Home, Office	Y
	Copy	ME <-> SIM	Y
	Move	ME <-> SIM	Y

	FDN		Y
	SDN		Y
	Email Entry		N
	Picture ID		N
	Video Caller ID		N
	vCard		N
	Business Card		Y
	Delete	Delete, Delete All(SIM or Phone), Multi Delete	Y
Supplementary Services	CFU	Call Forwarding Unconditional	Y
	CFB	Call Forwarding on Mobile Subscriber Busy	Y
	CFNRy	Call Forwarding on No Reply	Y
	CFNRc	Call Forwarding on Mobile Subscriber Not Reachable	Y
	BAOC	Barring of All Outgoing Calls	Y
	BOIC	Barring of Outgoing International Calls	Y
	BOICexHC	Barring of Outgoing International Calls except those directed to the Home PLMN Country	Y
	BAIC	Barring of All Incoming Calls	Y
	BICRoam	Barring of Incoming Calls when Roaming Outside the/Home PLMN Country	Y
	Conference Call	Up to 5 calls + 1 Waiting Call	Y
SIM	Plug in Type	3V & 1.8 V	Y
	SIM Lock	Service Provider / Network Lock / Hard Lock	Y
	SIM Toolkit	Class 3	Y
Short Message	Read Message		Y
	Write and Edit Message		Y
	Send and Receive Message		Y
	Reply to Message		Y
	Forward Message		Y
	Extract Number from Message		Y
	Message Status		Y
	Message Unread		Y
	Settable Message Center Number, Reply Path and Validity		Y
	Visible and Audible Message Receive		Y

	Voice Mail		Y
	Settable Voice Mail Center Number		Y
	Message Protocol	Normal, Fax, National Paging, X400, ERMES, Voice	Y
	Message Overflow Indicator		Y
	Message Center Number		Y
	Nokia Smart Message	Not supported. [Can be supported based on operator request]	N
Miscellaneous Function	Development & Test Facility		Y
	Field Test Facility		Y
	Display Software Version		Y
	IMEI		Y
	Restore Factory Setting		Y
	Battery Charging Mode		Y
Text Input	Language	Selectable Auto Language	Y
	Predictive word input	T9	Y
Scheduler	Calendar	MAX: 20 records (18 chars)	Y
	To Do		N
	Memo	MAX: 10 records (80 chars)	Y
World Time	Setting Local Time		Y
	Display Two Cities Time	Dual Clock	N
	Daylight saving		
	NITZ		Y
Unit converter		Length, Weight, Volume, Surface, Velocity, Temperature, User-defined	Y
Stop Watch			Y
Calculator		+ - * /	Y
PC Sync	Phone Book Sync	Only For service Center	Y
	Message Sync		N
Game		1Game , SuDoKu	Y
Security	Emergency Call		Y
	Handset Lock		Y
	Security Code	When Delete All	Y
	SIM Lock		Y

	Keypad Lock		Y
Real Time Clock	12/24 Hour		Y
	Calendar		Y
	Time Zone		Y
	Daylight saving		Y
	Alarm Manager		Y
	Dimming Clock		N
	Power-off Alarm		Y
	On Alarm Event		Y
Others	Mobile Tracking software	For India, Asia	Y
	M-DOG	For China	Y
Accessory	Micro SD Adapter		N
	Stereo Ear-mic without hook switch	Ear-mic type Stereo without hook key. Only FM play supports Stereo.	Y

3. TECHNICAL BRIEF

Digital Main Processor

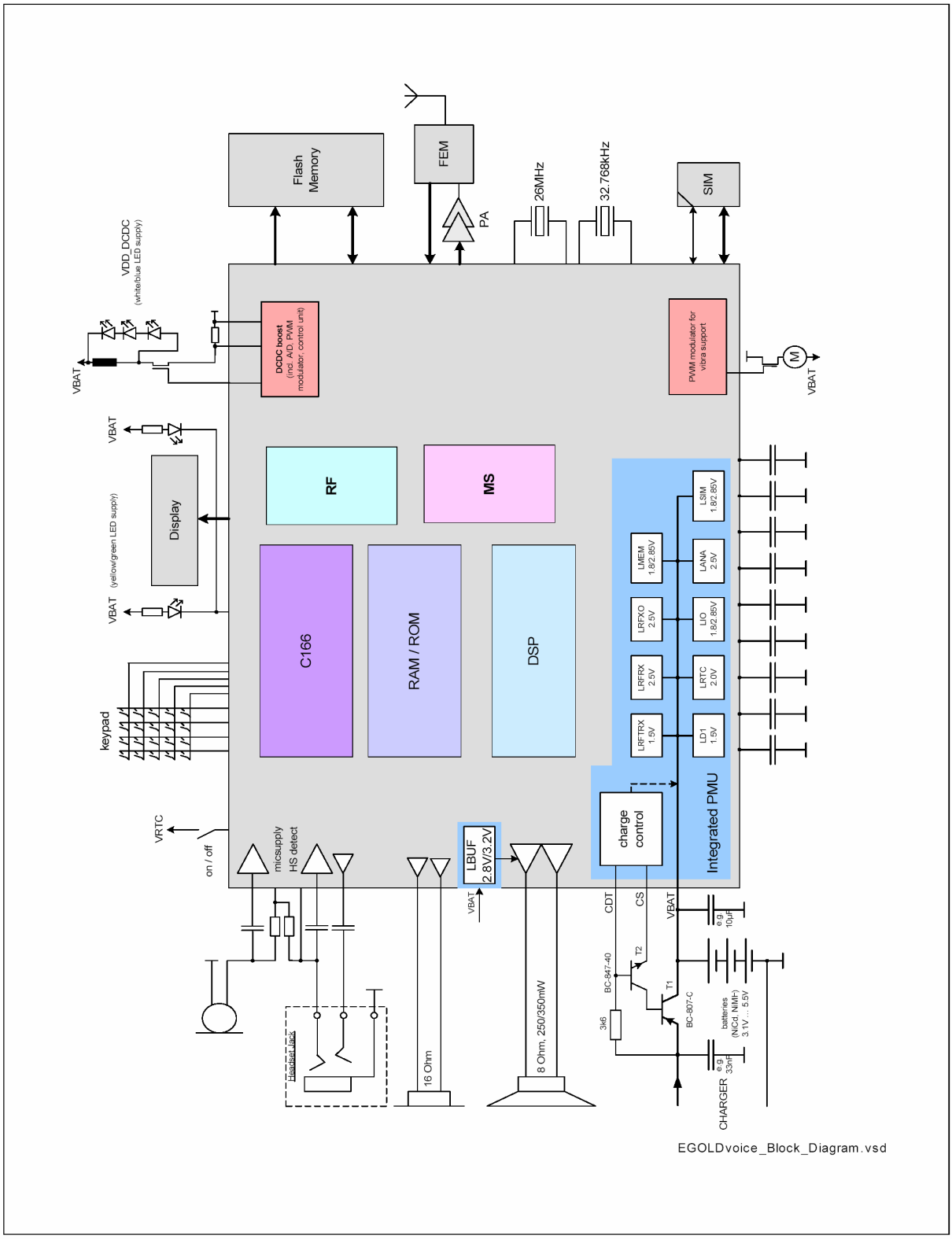


Figure.3-1 PMB7880 FUNCTIONAL BLOCK DIAGRAM

3.1.1 Overview of E-GOLDvoice

The E-GOLDvoice is a GSM baseband modem including RF transceiver covering the low bands GSM850 /GSM900 and high bands GSM1800 / GSM1900 bands.
E-GOLDvoice is Dual Band, therefore, it supports by default a low / high pair of bands at the same time:

1. GSM850 / GSM1800
2. GSM850 / GSM1900
3. GSM900 / GSM1800
4. GSM900 / GSM1900

The E-GOLDvoice is optimized for voice-centric Mobile Phone applications.
The E-GOLDvoice is designed as a single chip solution that integrates the digital, mixed-signal, RF functionality and a direct-to-battery Power Management Unit.

The transceiver consists of:

- Constant gain direct conversion receiver with an analog I/Q baseband interface
- Fully integrated Sigma/Delta-synthesizer capability
- Fully integrated two-band RF oscillator
- Two-band digital GMSK modulator with digital TX interface
- Digitally controlled crystal oscillator generating system clocks.

The E-GOLDvoice supports a direct battery connection, hence eliminating the need for an external Power Management Unit. The E-GOLDvoice has different power down modes and an integrated power up sequencer.

The E-GOLDvoice is powered by the C166®S MCU and TEAKLite® DSP cores. The operating temperature range from -40°C to 85°C. It is manufactured using the 0.13 μm CMOS process.

3.1.2 Features

Baseband

• High performance fixed-point TEAKlite DSP
• C166S high performance microcontroller
• There are several Interfaces:
– I2S interface for DAI connections (for Tape Approval)
– High Speed SSC Interface for connection of external peripherals
– SIM Interface
– Keypad Interface (6x4 or 5x5 keys)
– EBU for external RAM/FLASH connection
– Asynchronous serial interface (incl. IrDA support capability)
– JTAG Interface
– Black & white and color displays are supported
– PWM source to drive vibrator
– Keypad and display backlight supported.

Receiver

• Constant gain, direct conversion receiver with fully integrated blocking filter
• Two integrated LNAs
• No need of interstage and IF filter
• Highly linear RF quadrature demodulator
• Programmable DC output level
• Very low power budget.

Transmitter

• Digital Sigma-Delta modulator for GMSK modulation, typical -163.5 dBc/Hz @ 20 MHz
• Single ended outputs to PA, Pout = +3.5 dBm
• Very low power budget.

RF-Synthesizer

• ΣΔSynthesizer for multi-slot operation

• Fast lock-in times (< 150 µs)

• Integrated loop filter
• RF Oscillator
• Fully integrated RF VCO.

Crystal Oscillator

• Fully digital controlled crystal oscillator core with a highly linear tuning characteristic.

Mixed Signal and Power Management Unit

• DC/DC boost for voltages up to 15 V for driving White or Blue LEDs
• 8-Ohm loud speaker driver (250/350 mW)

• 16-Ohm earpiece driver
• 32-Ohm headset driver
• 4 measurement interfaces (PA temperature, battery voltage, battery temperature, and ambient temperature)
• Differential microphone input
• System start up circuitry
• Charger circuitry for NiCd, NiMh and LiIon cells
• Integrated regulators for direct connection to battery.

3.1.3 GSM System Description

The E-GOLDvoice is suited for mobile stations operating in the GSM850/900/1800/1900 bands. In the receiver path the antenna input signal is converted to the baseband, filtered, and then amplified to target level by the RF transceiver chip set. Two A-to-D converters generate two 6.5 Mbit/s data streams. The decimation and narrowband channel filtering is done by a digital baseband filter in each path. The DSP performs:

1. The GMSK equalization of the received baseband signal (SAIC support available)
2. Viterbi channel decoding supported by an hardware accelerator.

The recovered digital speech data is fed into the speech decoder. The E-GOLDvoice supports fullrate, halfrate, enhanced fullrate and adaptive multirate speech CODEC algorithms.

The generated voice signal passes through a digital voiceband filter. The resulting 4 Mbit/s data stream is D-to-A converted by a multi-bit-oversampling converter, postfiltered, and then amplified by a programmable gain stage.

The output buffer can drive a handset ear-piece or an external audio amplifier, an additional output driver for external loud speaker is implemented.

In the transmit direction the differential microphone signal is fed into a programmable gain amplifier. The prefiltered and A-to-D converted voice signal forms a 2 Mbit/s data stream. The oversampled voice signal passes a digital decimation filter.

The E-GOLDvoice performs speech and channel encoding (including voice activity detection (VAD) and discontinuous transmission (DTX)) and digital GMSK modulation.

In the RF transceiver part, the baseband signal modulates the RF carrier at the desired frequency in the 850 MHz, 900 MHz, 1.8 GHz, and 1.9 GHz bands using an I/Q modulator. The E-GOLDvoice supports dual band applications.

Finally, an RF power module amplifies the RF transmit signal at the required power level. Using software, the E-GOLDvoice controls the gain of the power amplifier by predefined ramping curves (16 words, 11 bits).

For baseband operation, the E-GOLDvoice supports:

- Making or receiving a voice call
- Sending or receiving an SMS.

3.1.4 PMU Details

The E-GOLDvoice includes battery charger support (various sensor connections for temperature, battery technology, voltage, etc.) and a ringer buffer.

E-GOLDvoice avoids the need for an external power management component because its internal power management unit contains:

- Voltage regulators for the On-chip and Off-chip functional blocks
- Charger circuitry for NiCd, NiMh and LiIon cells.

3.1.5 Bus Concept

The E-GOLDvoice has two cores (a microcontroller and a DSP), each with its own bus.
There is an interconnection between the TEAKlite bus and the C166S X-Bus.

3.1.6 C166S Buses

The C166S is connected to three buses:

1. Local Memory (LM) bus
2. X-Bus
3. PD-Bus.

3.1.7 TEAKLite Bus

The TEAKlite is connected to the TEAKlite bus.

3.1.8 Bus Interconnections

The interconnection between the X-Bus and the TEAKlite Bus uses:

- Multicore Synchronization
- Shared Memory.

3.1.9 Clock Concept

The E-GOLDvoice has a flexible clock control.

3.1.10 Interrupt Concept

The C166 MCU carries out the E-GOLDvoice interrupt system.

3.1.11 Debug Concept

The E-GOLDvoice includes a multi-core debug. The C166 and TEAKlite cores can be debugged in parallel with:

- A single JTAG port (that is, on a single host)
- Mutual breakpoint control.

3.1.12 C166 Debug Concept

The debugging of the C166 uses the OCDS and the Cerberus.

3.1.13 TEAKLite Debug Concept

TEAKlite debugging uses the OCEM and the SEIB.

3.1.14 Power Management

The E-GOLDvoice provides the power management unit (PMU) for the complete mobile phone application. The integrated PMU is directly connected to the battery and provides a set of linear voltage regulators (LDO's). These LDO's generate all required supply voltages and currents needed in a low feature mobile phone.

A charger control circuit charges NiCd, NiMH and LiIon batteries. The charger control supports hardware controlled pre-charging and software controlled charging. It offers a wide charger voltage range, making halfwave/ full-wave charging with cheap transformers possible.

White/blue backlight generation is supported with a special driver for very a low external parts count.

Power consumption during operation phases is minimized due to flexible clock switching

In the Standby Mode most parts of the device are switched off, only a small part is running at 32kHz and the controller RAM is switched to a power saving mode. The TEAKLite ROM can be

switched off during Standby via SW.

3.1.15 On-Chip Security Concept

Secure boot is based on a public/private key approach. Flash images that are not signed with the private key during phone manufacture cannot be loaded. Verification of the Flash code is done with the public key. The public key as well as hash and verify algorithms are stored in the ROM, which ensures a hardware secured boot procedure.

The following security features are supported:

• Prevention of illegal Flash programming

• Flash programming makes use of the E-GOLDvoice ID for personalization checks with IMEI and SIM-lock protection

The security features use the following mechanism:

• Boot ROM flow:

– Controls the boot transition to external flash

– Controls the flash update

• Flash tied to the individual chip via an ID using e-fuses, that is, each E-GOLDvoice chip has its own fused ID.

Further details on the E-GOLDvoice security concept are not publicly documented.

3.1.16 Asynchronous Operation Mode Concept

The E-GOLDvoice can operate in either:

• The traditional synchronous mode with the 26 MHz system clock synchronized on the base station

• A special asynchronous mode (XO concept).

In the asynchronous mode the 26 MHz clock input is not synchronized with the base station; the residual frequency offset is compensated in the digital signal processing domain. This processing includes frequency and timing compensation of the baseband and voiceband signals.

Power Amplifier Module(SKY77517/ SKY77518)

3.2.1 GB100/GB100b/GB105/GB105b (SKY77518)

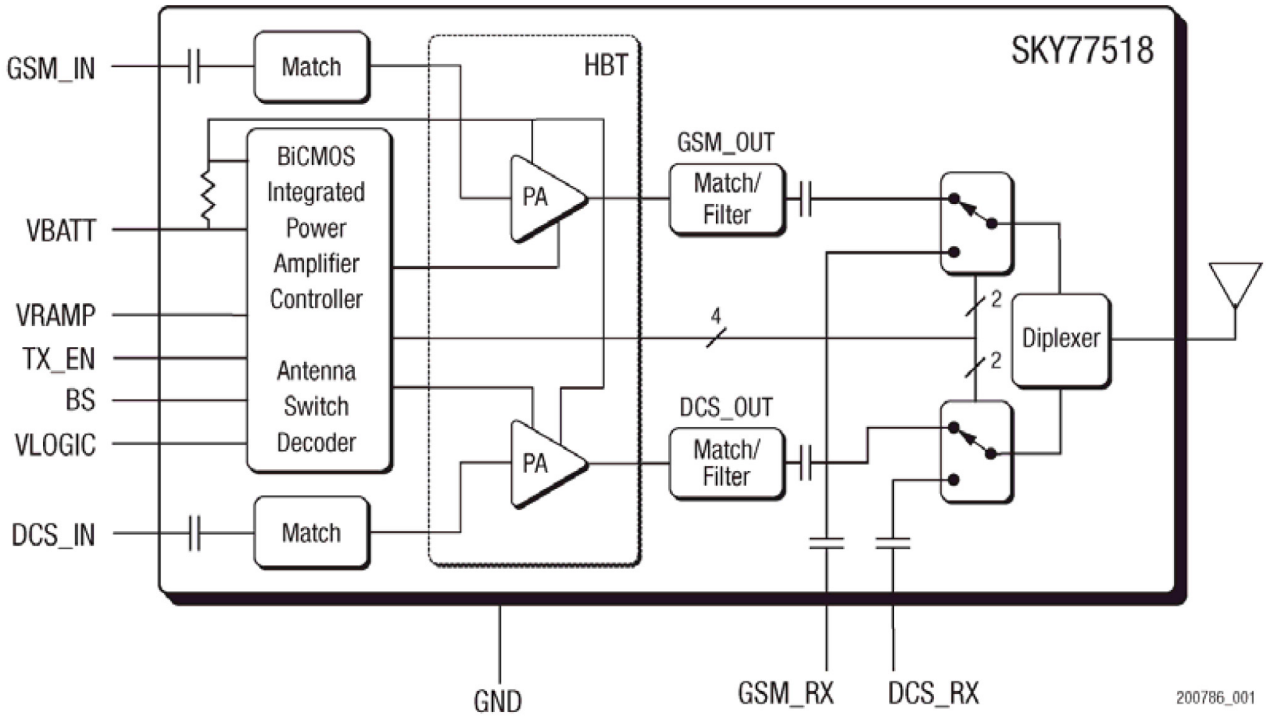


Figure.3-2-1 SKY77518 FUNCTIONAL BLOCK DIAGRAM

The SKY77518-21 is a transmit and receive front-end module (FEM) with Integrated Power Amplifier Control (iPAC™) for dual-band cellular handsets comprising GSM900 and DCS1800 operation. Designed in a low profile, compact form factor, the SKY77518-21 offers a complete Transmit VCO-to- Antenna and Antenna-to-Receive SAW filter solution. The FEM also supports Class 12 General Packet Radio Service (GPRS) multi-slot operation.

The module consists of a GSM900 PA block and a DCS1800 PA block, impedance-matching circuitry for 50 Ω input and output impedances, TX harmonics filtering, high linearity and low insertion loss PHEMT RF switches, diplexer and a Power Amplifier Control (PAC) block with internal current sense resistor. A custom BiCMOS integrated circuit provides the internal PAC function and decoder circuitry to control the RF switches. The two Heterojunction Bipolar Transistor (HBT) PA blocks are fabricated onto a single Gallium Arsenide (GaAs) die. One PA block supports the GSM900 band and the other PA block supports the DCS1800 band. Both PA blocks share common power supply pads to distribute current. The output of each PA block and the outputs to the two receive pads are connected to the antenna pad through PHEMT RF switches and a diplexer. The GaAs die, PHEMT die, Silicon (Si) die and passive components are mounted on a multi-layer laminate substrate.

The assembly is encapsulated with plastic overmold. Band selection and control of transmit and receive modes are performed using two external control pads. Refer to the functional block diagram in Figure.3-2-1 below. The band select pad (BS) selects between GSM and DCS modes of operation. The transmit enable (TX_EN) pad controls receive or transmit mode of the respective RF switch (TX = logic 1). Proper timing between transmit enable (TX_EN) and Analog Power Control (VRAMP) allows for high isolation between the antenna and TXVCO while the VCO is being tuned prior to the transmit burst.
The SKY77518-21 is compatible with logic levels from 1.2 V to VCC for BS and TX_EN pads, depending on the level applied to the VLOGIC pad. This feature provides additional flexibility for the designer in the selection of FEM interface control logic.

3.2.2 GB100a/GB105a (SKY77517)

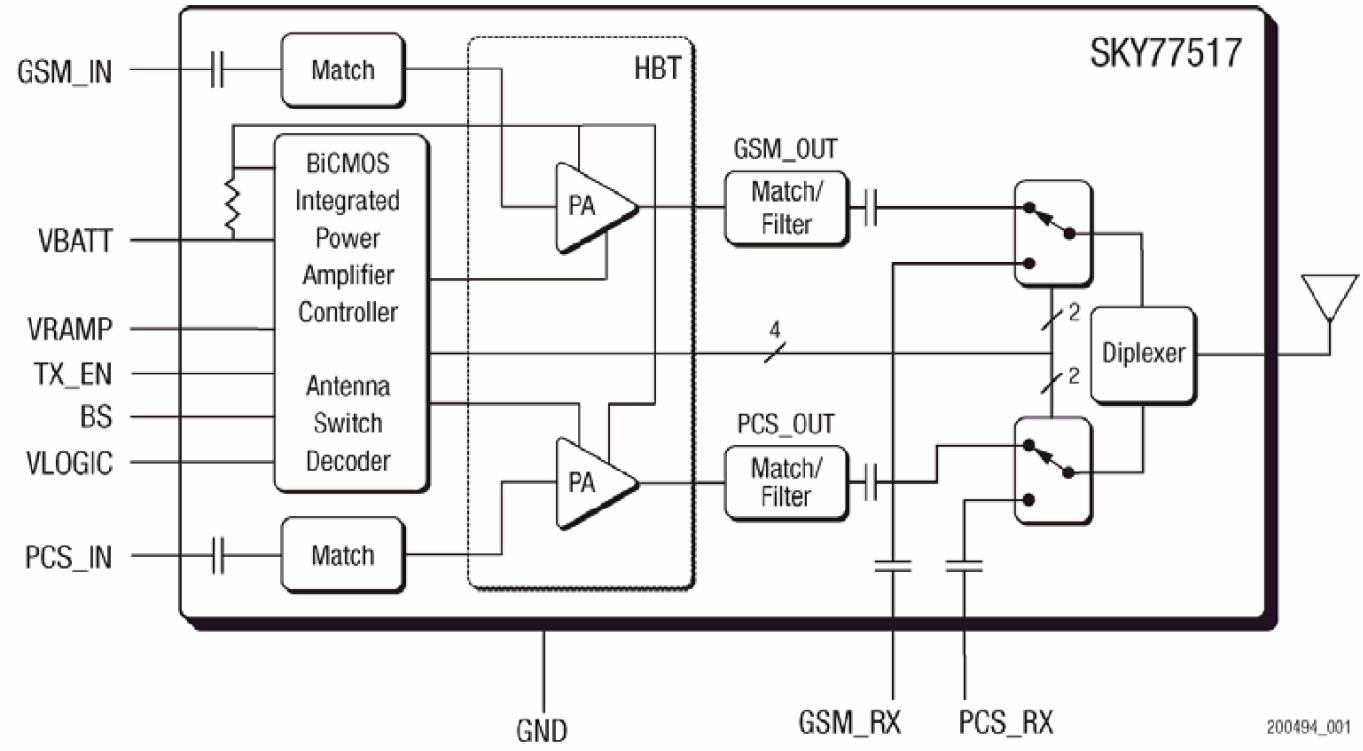


Figure.3-2-2 SKY77518 FUNCTIONAL BLOCK DIAGRAM

The SKY77517 – 21 is a transmit and receive front-end module (FEM) with Integrated Power Amplifier Control (iPAC.) for dual-band cellular handsets comprising GSM850 and PCS1900 operation. Designed in a low profile, compact form factor, the SKY77517 – 21 offers a complete Transmit VCO-to-Antenna and Antenna-to-Receive SAW filter solution. The FEM also supports Class 12 General Packet Radio Service (GPRS) multi-slot operation.
The module consists of a GSM850 PA block and a PCS1900 PA block, impedance-matching circuitry for 50 Ω input and output impedances, TX harmonics filtering, high linearity and low insertion loss PHEMT RF switches, diplexer and a Power Amplifier Control (PAC) block with internal current sense resistor.

A custom BiCMOS integrated circuit provides the internal PAC function and decoder circuitry to control the RF switches. The two Heterojunction Bipolar Transistor (HBT) PA blocks are fabricated onto a single Gallium Arsenide (GaAs) die. One PA block supports the GSM850 band and the other PA block supports the PCS1900 band. Both PA blocks share common power supply pads to distribute current. The output of each PA block and the outputs to the two receive pads are connected to the antenna pad through PHEMT RF switches and a diplexer. The GaAs die, PHEMT die, Silicon (Si) die and passive components are mounted on a multi-layer laminate substrate. The assembly is encapsulated with plastic overmold.

Band selection and control of transmit and receive modes are performed using two external control pads. Refer to the functional block diagram in Figure.3-2-2 below. The band select pad (BS) selects between GSM and PCS modes of operation. The transmit enable (TX_EN) pad controls receive or transmit mode of the respective RF switch (TX = logic 1). Proper timing between transmit enable (TX_EN) and Analog Power Control (VRAMP) allows for high isolation between the antenna and TX-VCO while the VCO is being tuned prior to the transmit burst.

The SKY77517 is compatible with logic levels from 1.2 V to VCC for BS and TX_EN pads, depending on the level applied to the VLOGIC pad. This feature provides additional flexibility for the designer in the selection of FEM interface control logic.

26MHz Clock (DCXO)

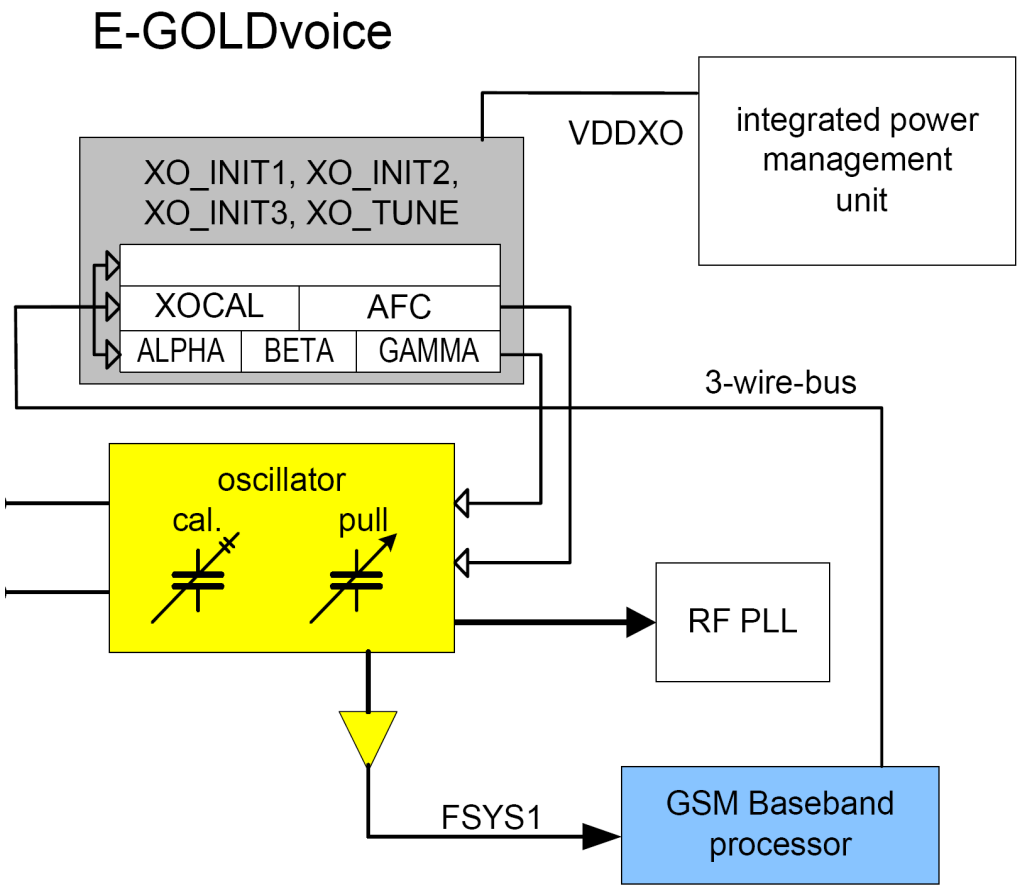


Figure.3-3 Crystal Oscillator Functional Overview

The XO_TUNE register holds the digital correction value for the crystal oscillator frequency. The XOMODE bits of XO_INIT1 register contain setup informations for the crystal oscillator (for example, current programming, etc.).See Figure .3-3 Crystal Oscillator Functional Overview.

The registers XO_INIT2 and XO_INIT3 contain the coefficients information for the linearization unit of crystal oscillator (LUXO) This linearization unit computes the required digital control word out of the programmed AFC bits in order to have a linear pulling curve ppm vs. AFC word. The resulting digital control word DIG is filtered by a digital lowpass filter, which can be scaled or deactivated using the bits DIGFILT0 and DIGFILT1 of the XO_INIT3 register.

The frequency correction splits into 2 parts:

1. The XOCAL bits in the XO_INIT1 register are used for the coarse frequency adjustment and are set once for a mobile lifetime (during production test)
2. The XO_TUNE register contains the information for frequency correction when the mobile is used (correction of temperature drift, crystal aging)

RTC(32.768KHz Crystal)

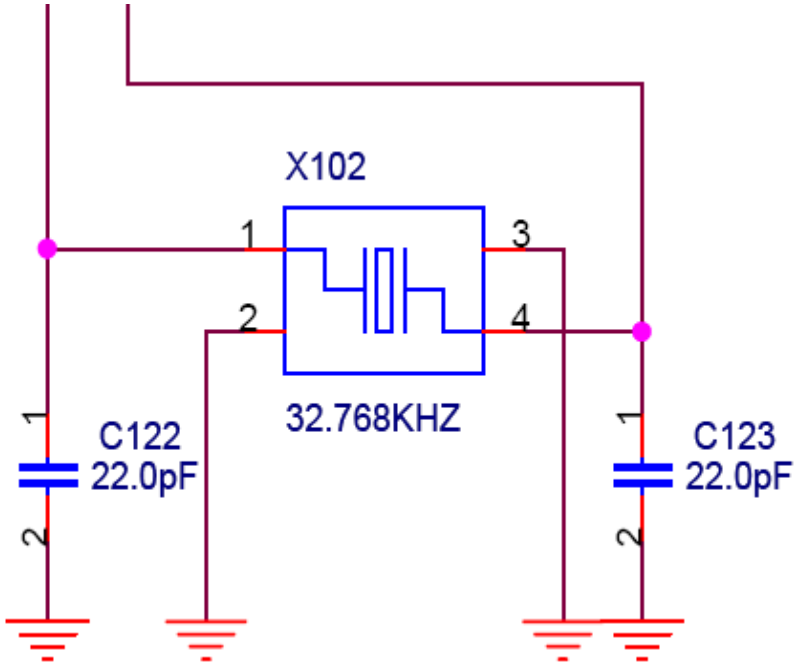


Figure.3-4 E-GoldVoice RTC Interface

The integrated Real Time Clock (RTC) is able to provide programmable alarm functions and external interrupts. Due to its extreme low power consumption the RTC can be supplied from a small backup battery. This allows the generation of external interrupts, even when the main PMB7880 supply voltage is switched off. For this purpose the RTC is powered by own voltage supply pins VDD_RTC and VSS_RTC.

The RTC shall be driven by a 32.768 kHz (32k) clock which needs to be applied via the PMB7880 F32K and OSC32K pins. The clock can be fed from either an external clock source or use the on chip 32 KHz oscillator module.

The low clock frequency and the optimized low power design give the possibility to run the chip with a minimum of power dissipation. For example, for this specific application the 26 MHz reference oscillator can be switched off during system standby and a lowpower time reference can be kept when the 32k clock is provided to the RTC.

The RTC consists of an PMB7880 specific RTC shell, containing the RTC macro, as well as the 32 kHz oscillator, as described in the following sections. The module RTC Shell solely performs level translation of the 32KHz clock to the VDD_LD1 power supply domain, and is not functionally associated with the RTC.

3.5 LCD Interface(3 wire SPI interface)

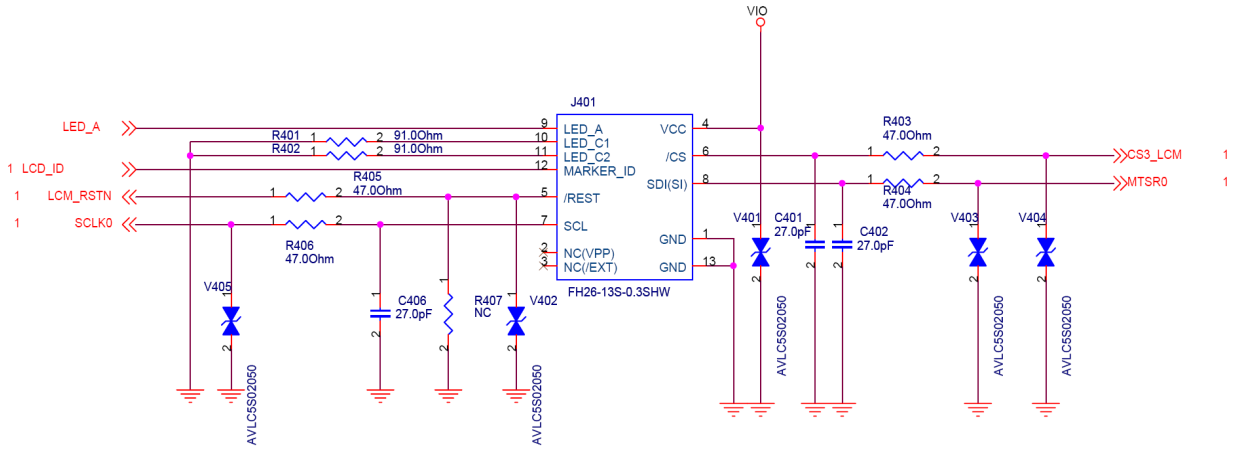


Figure.3-5-1 LCD Interface

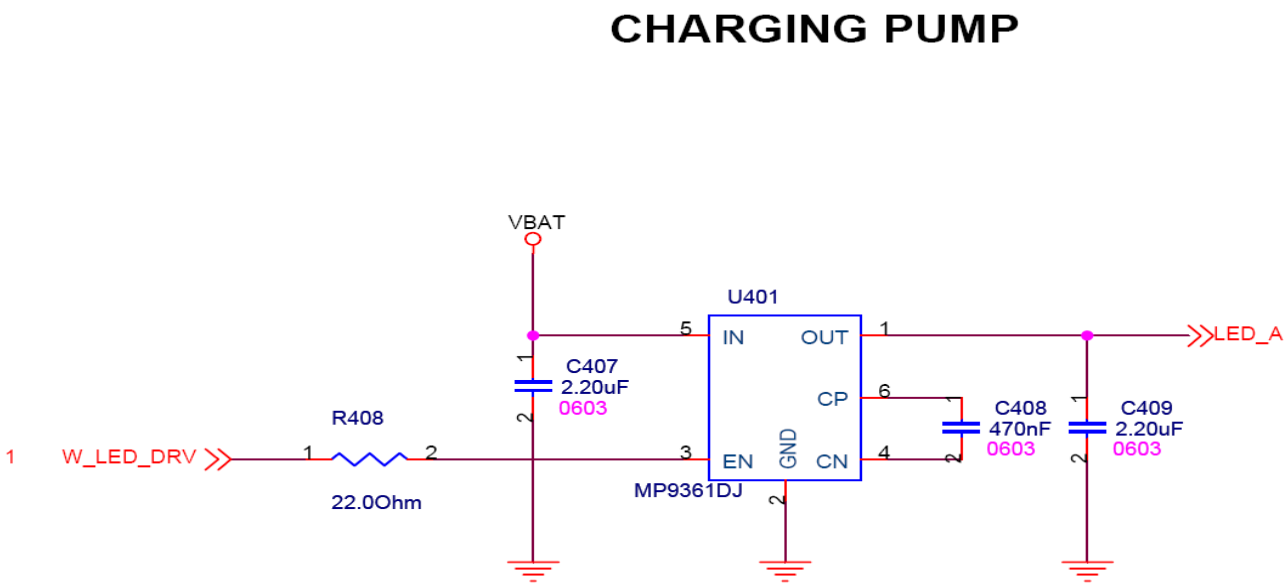


Figure.3-5-2 Charging PUMP Interface

Signals	Description
_LCD_CS	This signal enable to access to the driver IC of LCD.
SSC0_MTSR	This signal transfer serial data to driver IC.
SSC0_CLK	This signal transfer serial clock to driver IC.
LCD_RESET	This signal makes driver IC to HW default status.
MLED	This signal provide power to white LEDs.
MLED1/2	This signal be feed back from white LEDs.
2V8_VIO	This signal provides power to LCD modules.(2.8V)

The AAT3157 is a low noise, constant frequency charge pump DC/DC converter that uses a trimode load switch (1X), fractional (1.5X), and doubling (2X) conversion to maximize efficiency for white LED applications. The AAT3157 is capable of driving up to three channels of LEDs at 20mA per channel from a 2.7V to 5.5V input.

The current sinks may be operated individually or in parallel for driving higher current LEDs. A low external parts count (two 1μF flying capacitors and two small 1μF capacitors at VIN and VOUT) make this part ideally suited for small, battery-powered applications. AnalogicTech's S2Cwire™ (Simple Serial Control™) serial digital input is used to enable, disable, and set current for each LED with 16 settings down to 50μA.

The low-current mode supply current can be as low as 50μA to save power.

Data	Output (mA/Ch)	Data	Output (mA/Ch)
1	20.0	9	5.0
2	17.0	10	4.2
3	14.0	11	3.4
4	12.0	12	2.8
5	10.0	13	1.0
6	8.6	14	0.5
7	7.0	15	0.1
8	6.0	16	0.05

Figure 3-5-3. Charge pump Output Current

3.6 SIM Card Interface

SIM CONNECT

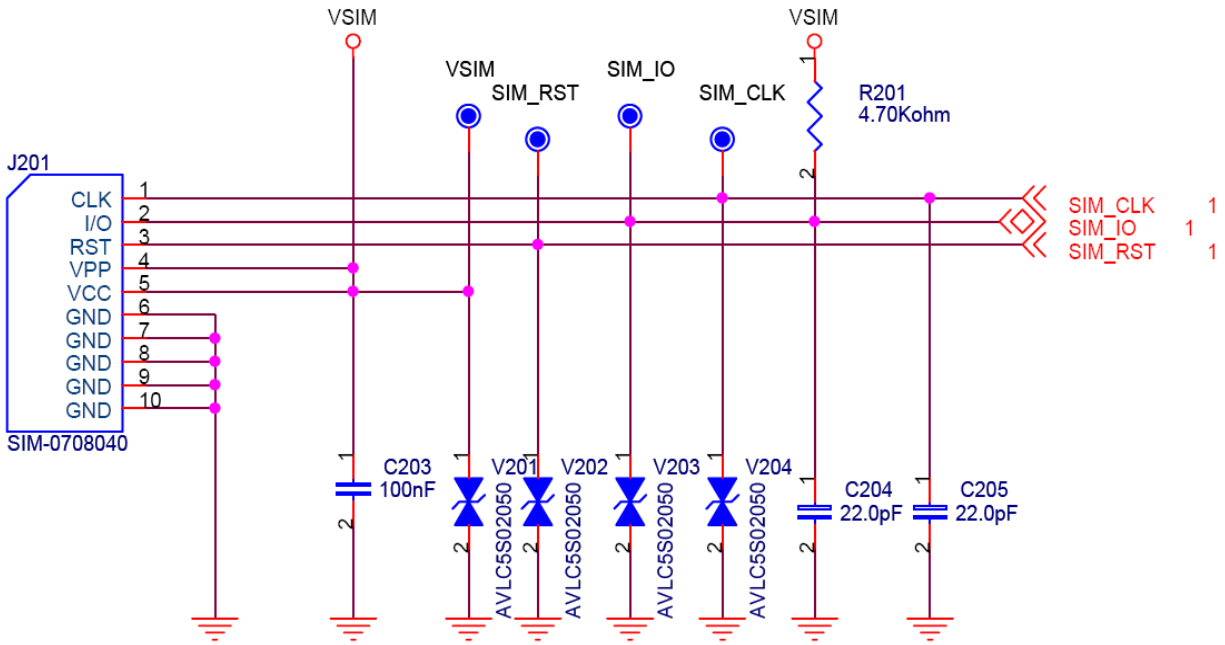


Figure.3-6 SIM CARD Interface

The EGoldVoice provides SIM Interface Module. The AD6527 checks status Periodically During established call mode whether SIM card is inserted or not, but it doesn't check during deep sleep mode. In order to communicate with SIM card, 3 signals SIM_DATA, SIM_CLK, SIM_RST.

Signals	Description
SIM_RST	This signal makes SIM card to HW default status.
SIM_CLK	This signal is transferred to SIM card.
SIM_DATA	This signal is interface datum.

3.7 KEYPAD Interface

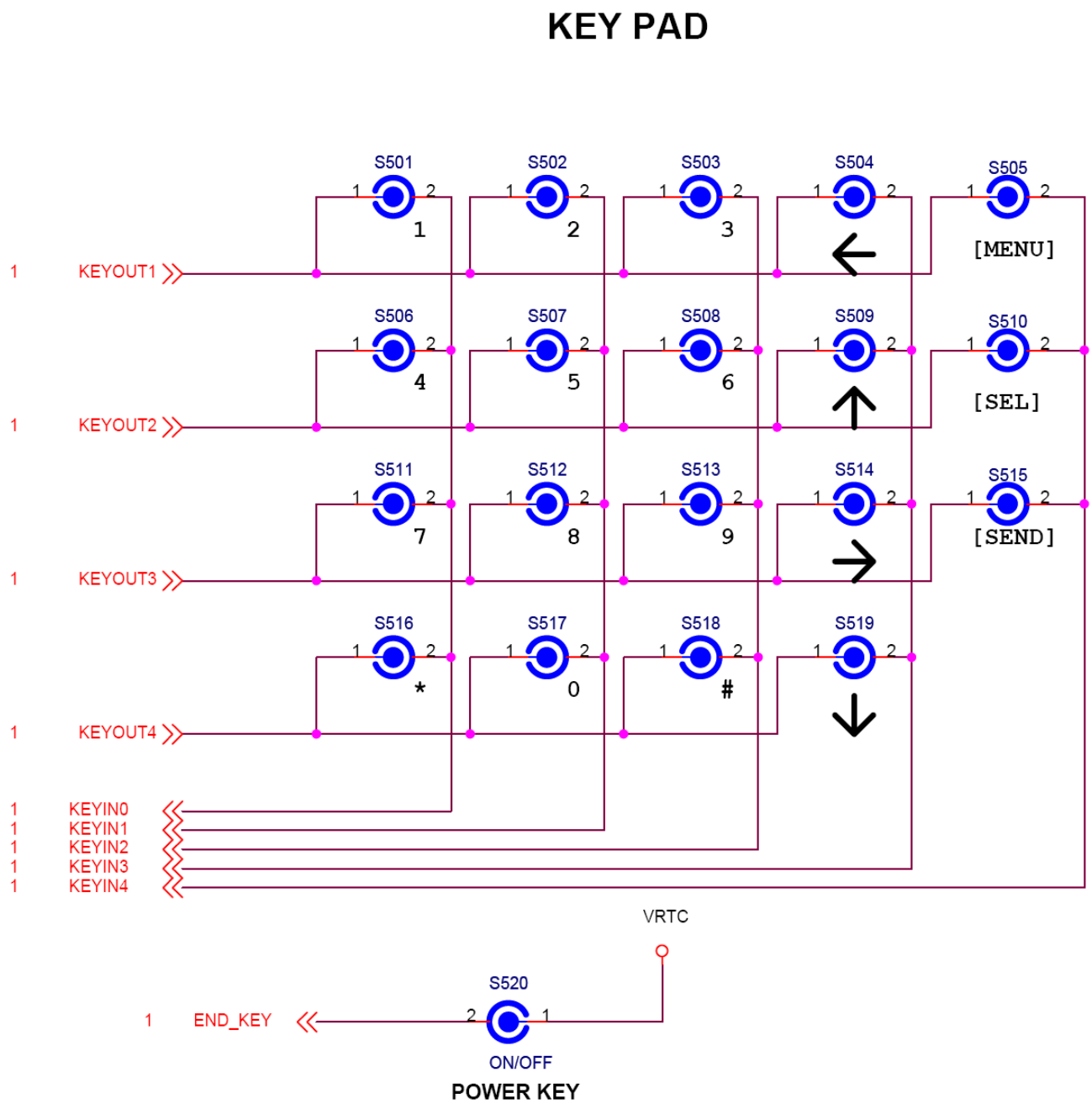


Figure.3-7 KEY MAXTRIX Interface

The keypad interface is connected to the X-Bus, together with the XBIU and the Shared Memory Register, using a single Bus Interface.

The keypad supports two scan modes:

- By default, the keypad is a 4x6 scan matrix (4 input and 6 output pins).
- To set the keypad to a 5x5 scan matrix (5 input and 5 output pins)

The scan mode should be determined at the very beginning of the system start because changes are not allowed later.

3.8 Battery Charging Block Interface

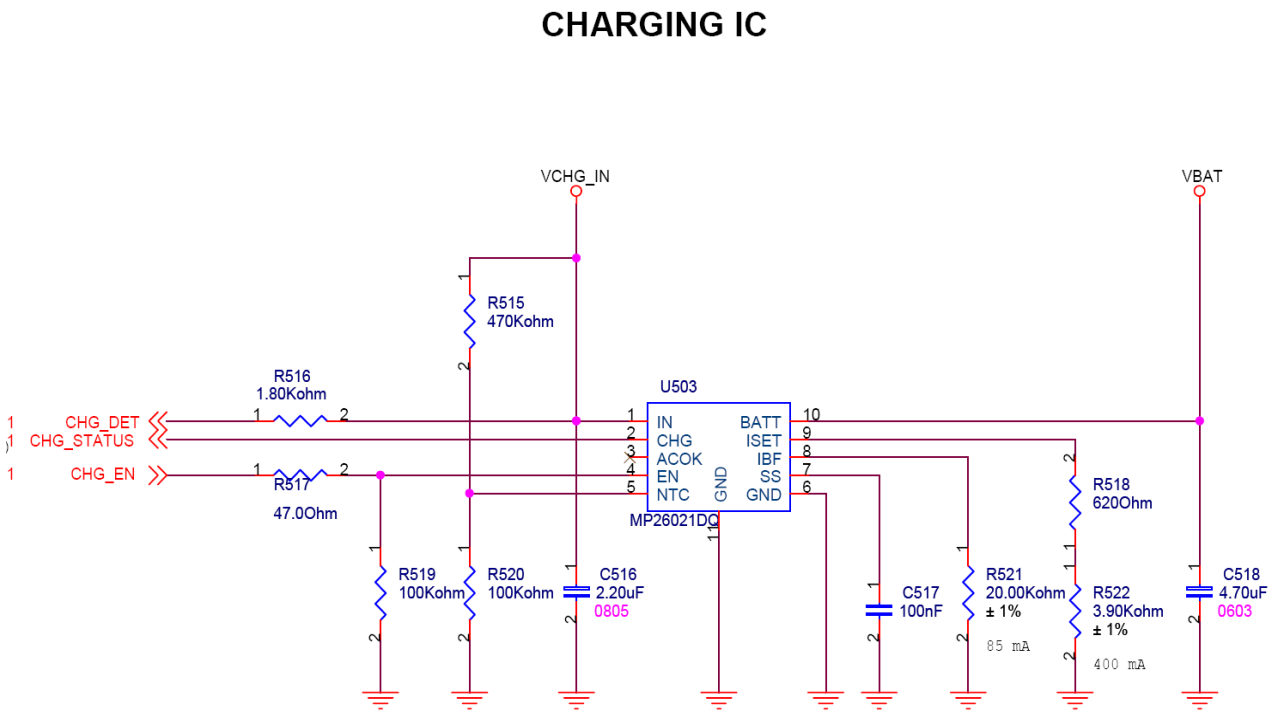


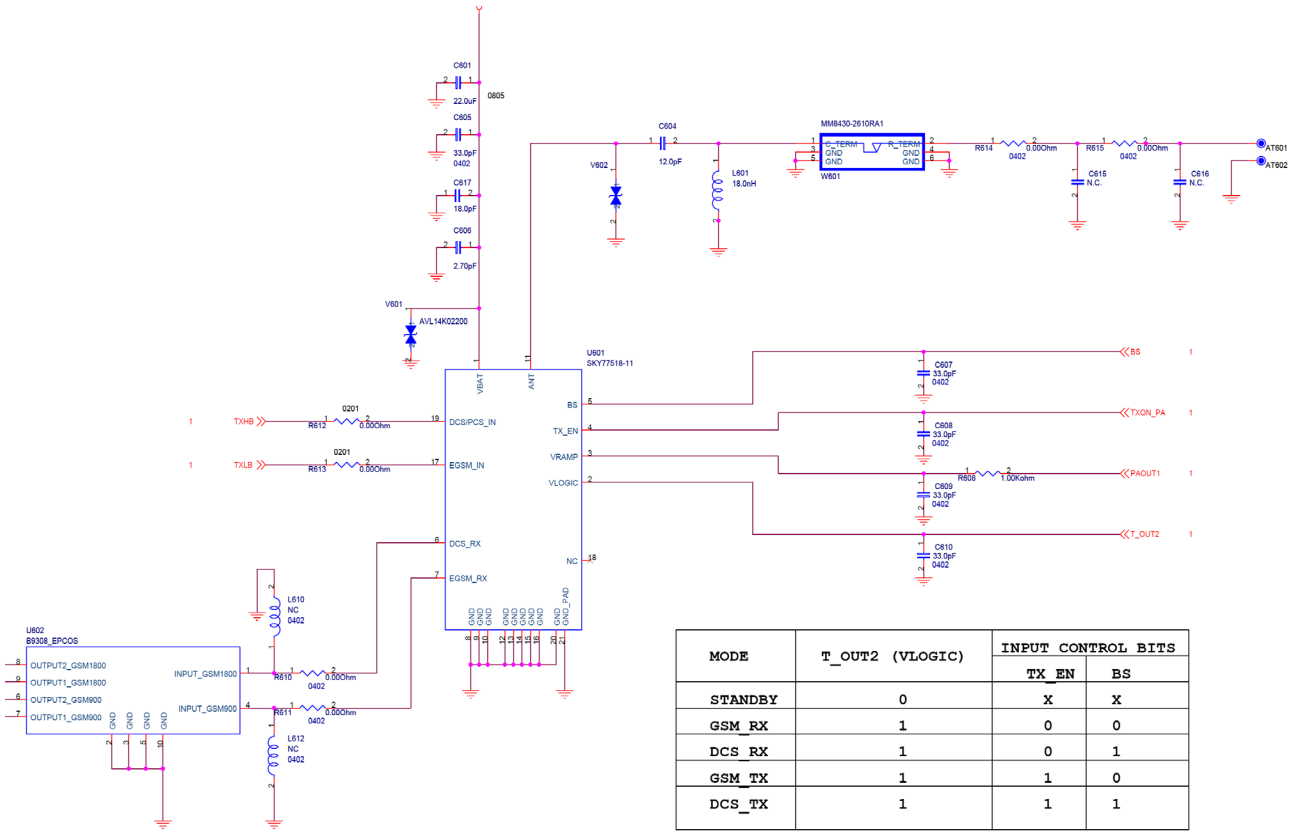
Figure.3-8 Charging IC Interface

The MP26021 is a linear, high-performance single cell Li-Ion battery charger. By integrating high voltage input protection into the charger IC, the MP26021 can Tolerate an input surge up to 28V

The device features constant current (CC) and constant voltage (CV) charging modes with programmable charge currents(85mA to 1A), programmable battery full threshold, thermal protection, battery temperature monitoring, reverse current blocking and trickle charge. The device also provides AC adapter power good and Charge status indications to the system.

MP26021 is available in a 10-pin 3mm x 3mm QFN package.

3.9 RF Interface



MODE	T_OUT2 (VLOGIC)	INPUT CONTROL BITS	
		TX_EN	BS
STANDBY	0	X	X
GSM_RX	1	0	0
DCS_RX	1	0	1
GSM_TX	1	1	0
DCS_TX	1	1	1

Figure.3-9 RF Module/SAW Filter Interface

E-GOLDvoice features a fully integrated constant-gain direct conversion receiver, i.e. there is no interstage filter needed and the baseband level at the analogue IQinterface follows directly the RF input level. Depending on the baseband ADC dynamic range, single- or multiple-step gain switching schemes are possible.

An integrated, selfaligning, low-pass filter ensures the receivers to function under blocking and reference interference conditions and avoids aliasing by baseband sampling. An automatic DC-offset compensation is implemented and can be switched depending on the gain setting.

The digital transmitter architecture is based on a fractional-N sigma-delta synthesizer for constant envelope GMSK modulation. This configuration allows a very low power design with a reduced external component count.

The modulation is transferred between baseband- and RF-part of the PMB7880 via a digital interface signal into the digital modulator. The following Gaussian filter shapes the digital data stream for the GMSK modulation. Additionally a pre-distortion filter compensates the attenuation of the PLL transfer function resulting in a very low distortion at the transmit output.

The filtered digital data stream is scaled appropriately and added to the channel word.

This sum is fed into the MASH modulator. The output of the MASH modulator is a sequence of integer divider values representing the high resolution fractional input signal. This sequence controls the MMD (multi modulus divider) at a sample rate of 26MHz. Thus a tightly controlled frequency modulation of the VCO is achieved.

3.10 Audio Interface

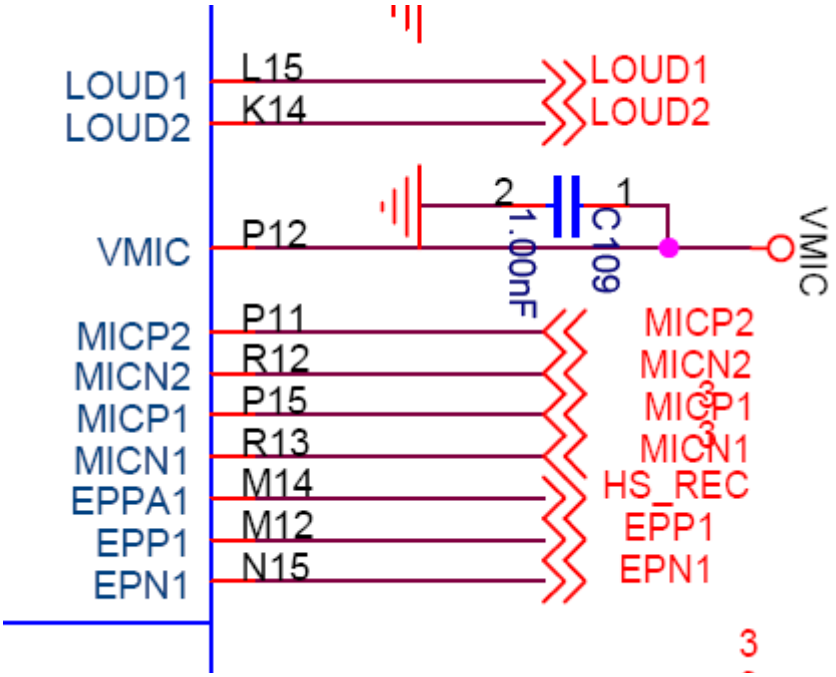


Figure.3-10-1 Audio Interface

The audio front-end of E-GOLDvoice offers the digital and analog circuit blocks for both receive and transmit audio operation and ringing. It features a high-quality, digital-to-analog path with amplifying stages for connecting acoustic transducers to the E-GOLDvoice. In the transmit direction the supply voltage generation for microphones, low-noise amplifier and analog to digital conversion are integrated on the E-GOLDvoice.

For E-GOLDvoice the EPp1/EPn1 driver are used as differntial Earpiece-Driver, EPPa1 is used as single-ended Headset-Driver.

The audio front-end itself can be considered to be organized in three sub-blocks:

- Interface to processor cores (TEAKlite and - indirectly - C166S)
- Digital filters
- Analog part.

The interface to the processor cores consists of a direct physical connection to the TEAKlite DSP bus and a set of firmware commands to handle communication between the C166S and the audio front-end which serves as the interface peripheral for audio algorithms running on the DSP or the controller. The audio front-end Generates interrupts on certain occasions, for example, when exchange of data is requested. The core interface part of the audio front-end also contains the control and status registers which are used to set up certain operation modes of the peripheral.

The section next to the core interface contains the digital filters for interpolation and decimation of the audio signals being received and transmitted. The data path for the receive direction can be set up to process sampling rates between 8kHz and 48kHz.

The interpolation filters for the respective sampling rates are implemented in a dedi-cated hardware block and are automatically selected to suite the chosen sampling rate. Low-pass interpolation filtering, which produces an unsigned 16-bit data stream with a sampling rate of 4 MHz, is performed digitally. D-to-A conversion, postfiltering, and final amplification are performed on the analog part. The amplifier buffer for voiceband receive does also support ringer functionality. The ringer functionality is activated by Setting bits RINGSELPN or RINGSELPA in the voiceband part of the analog control register.

In transmit direction, amplification, prefiltering and A-to-D conversion (analog $\sum\Delta$ modulation) are performed on the analog part. The resulting 2-Mbit/s data stream is filtered by a digital low-pass decimation filter for further processing by DSP firmware.

Two sampling rates, 8kHz and 16kHz, are supported. The analog section contains all the necessary analog functional blocks including microphone supply generation, output and input amplifiers and analog filtering.

Signals	Description
EPp1	Main Receiver Positive signal(Differential signal)
EPn1	Main Receiver Negative signal(Differential signal)
EPpa1	Headset signal(Single Ended signal)
Loud1	Speaker Output Positive signal(Differential signal)
Loud2	Speaker Output Negative signal(Differential signal)
MICP1	Main Microphone Positive signal(Differential signal)
MICN1	Main Microphone Negative signal(Differential signal)
MICP2	Headset Microphone Positive signal(Differential signal)
MICN2	Headset Microphone Negative signal(Differential signal)
VMIC	Main/Headset Microphone supply power

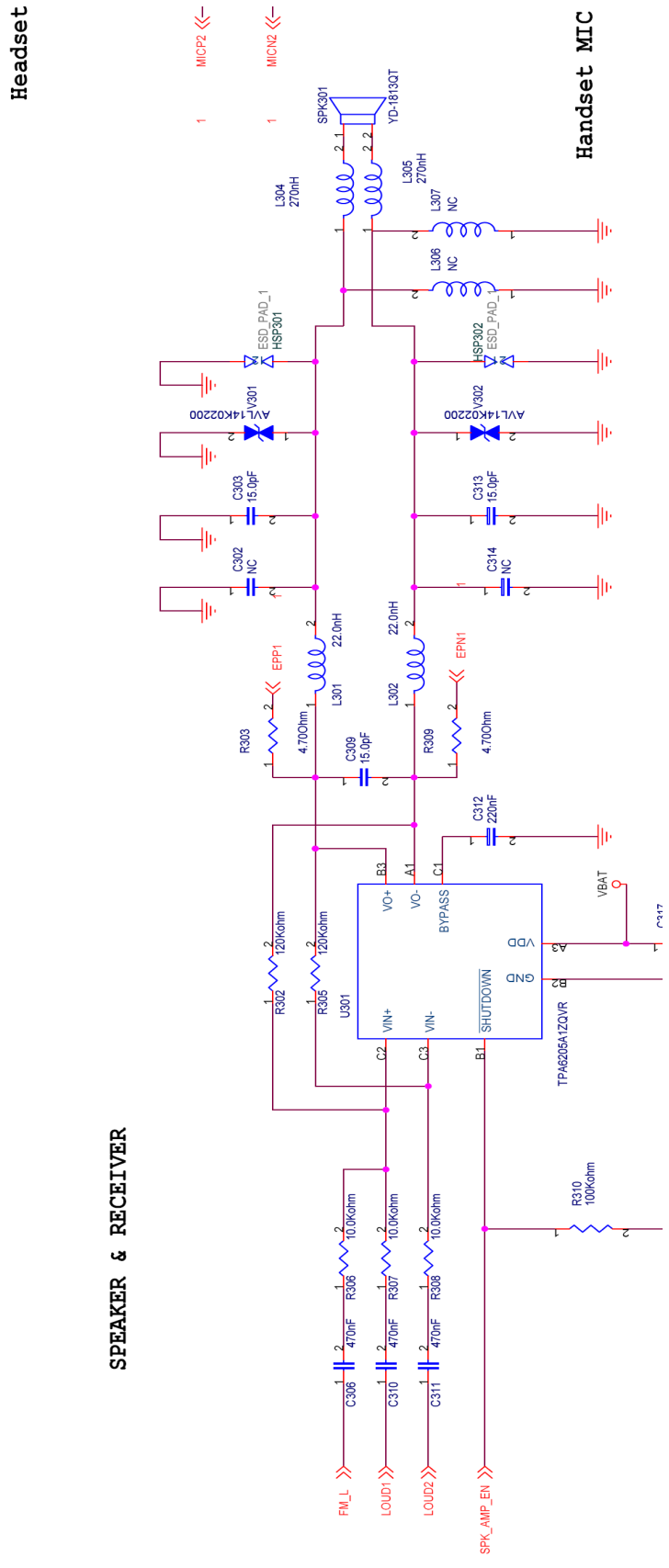


Figure.3-10-2 Main Speaker(Receiver) Interface

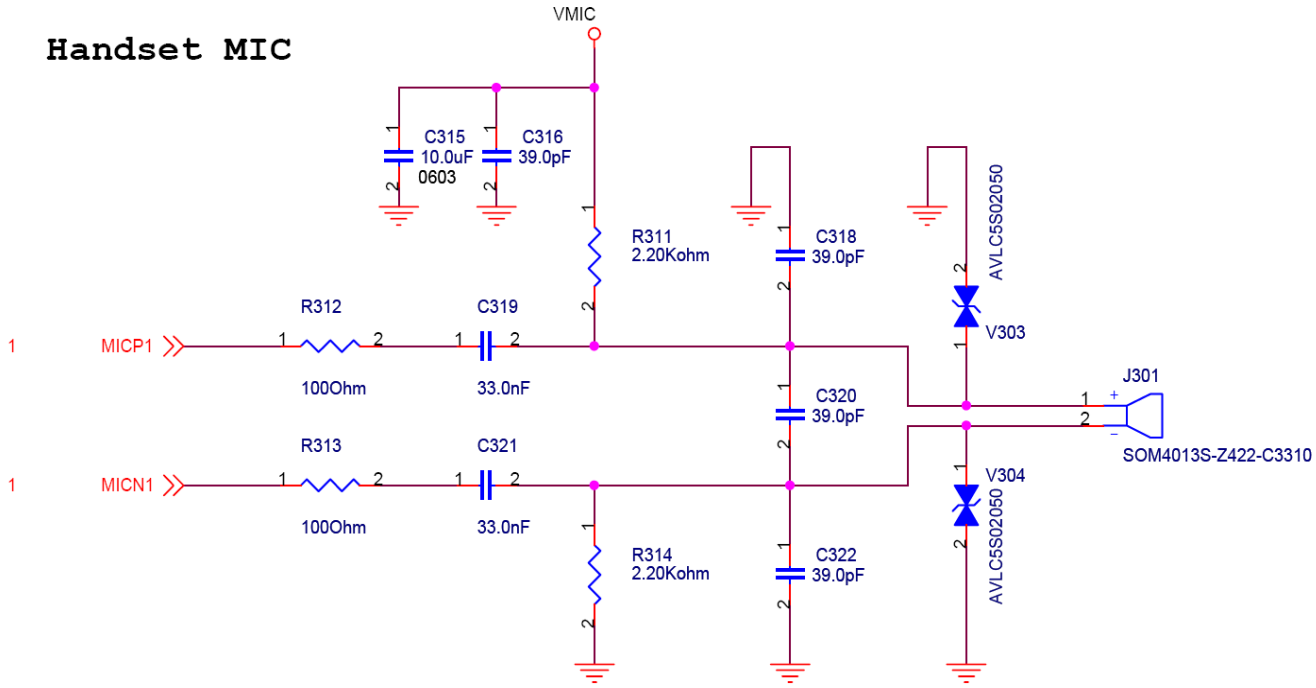


Figure.3-10-3 Main Microphone Interface

I/O CONNECTOR

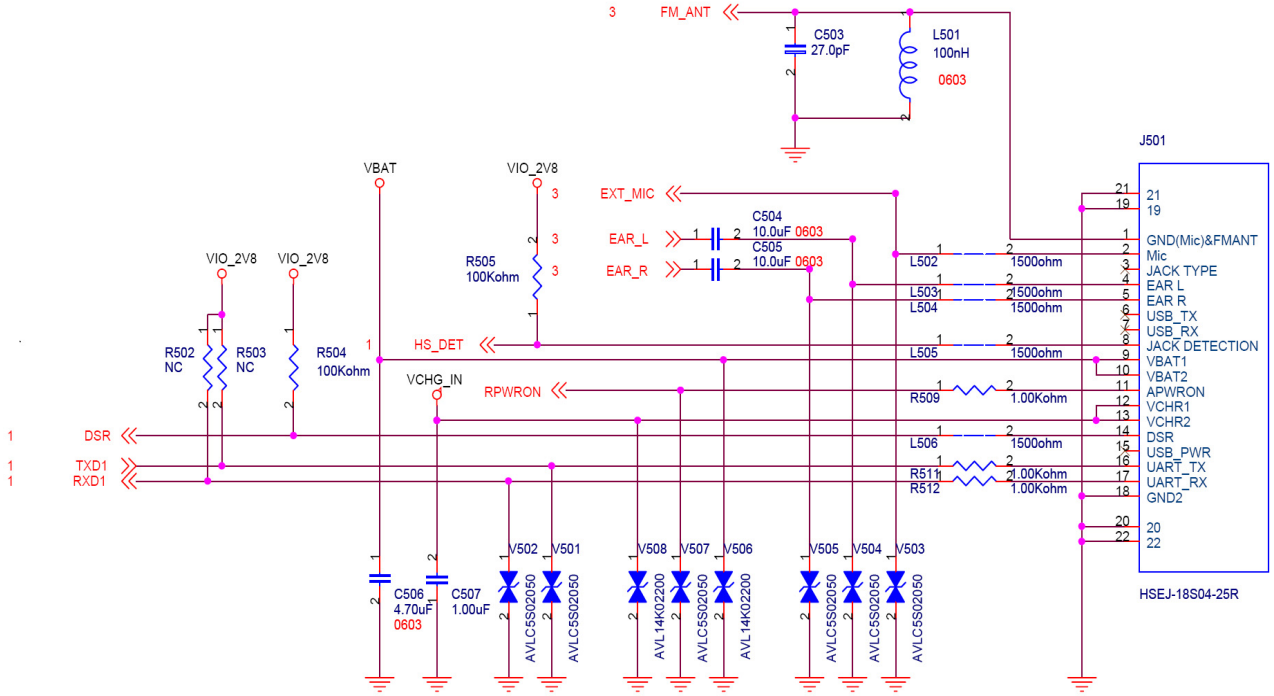


Figure.3-10-4 Headset Interface

3.11 Key LED Interface

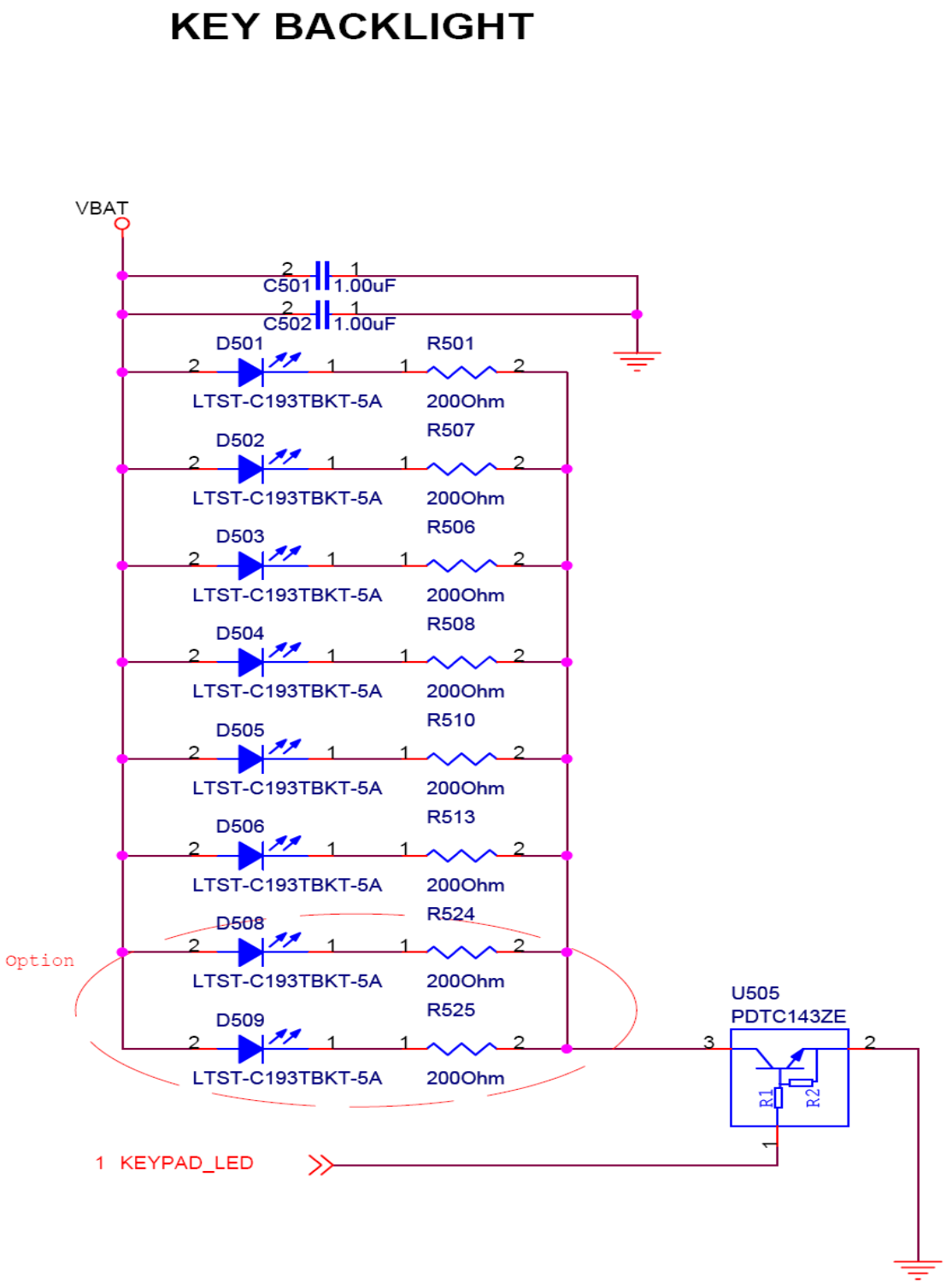


Figure.3-11 Key LED Interface

This handset has 8 LEDs that illuminates blue color.

Control signal is controlled by E-GoldVoice with PWM and handset has 3 methods, ON, OFF, Dimming.

3.12 Vibrator Interface

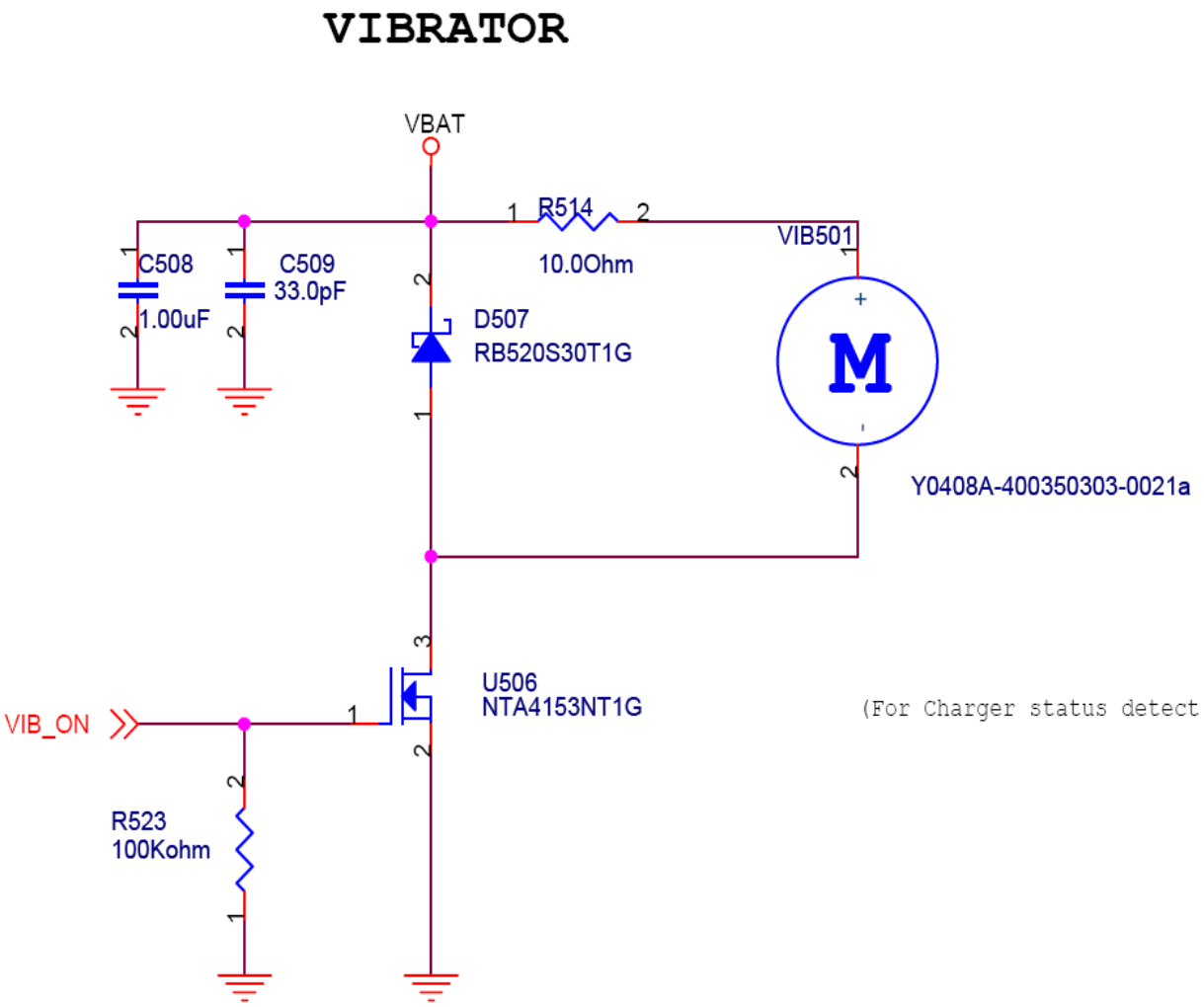


Figure.3-12 Vibrator Interface

This handset has Vibrator operation. Control signal is controlled by E-GoldVoice with PWM.

3.13 Memory Interface

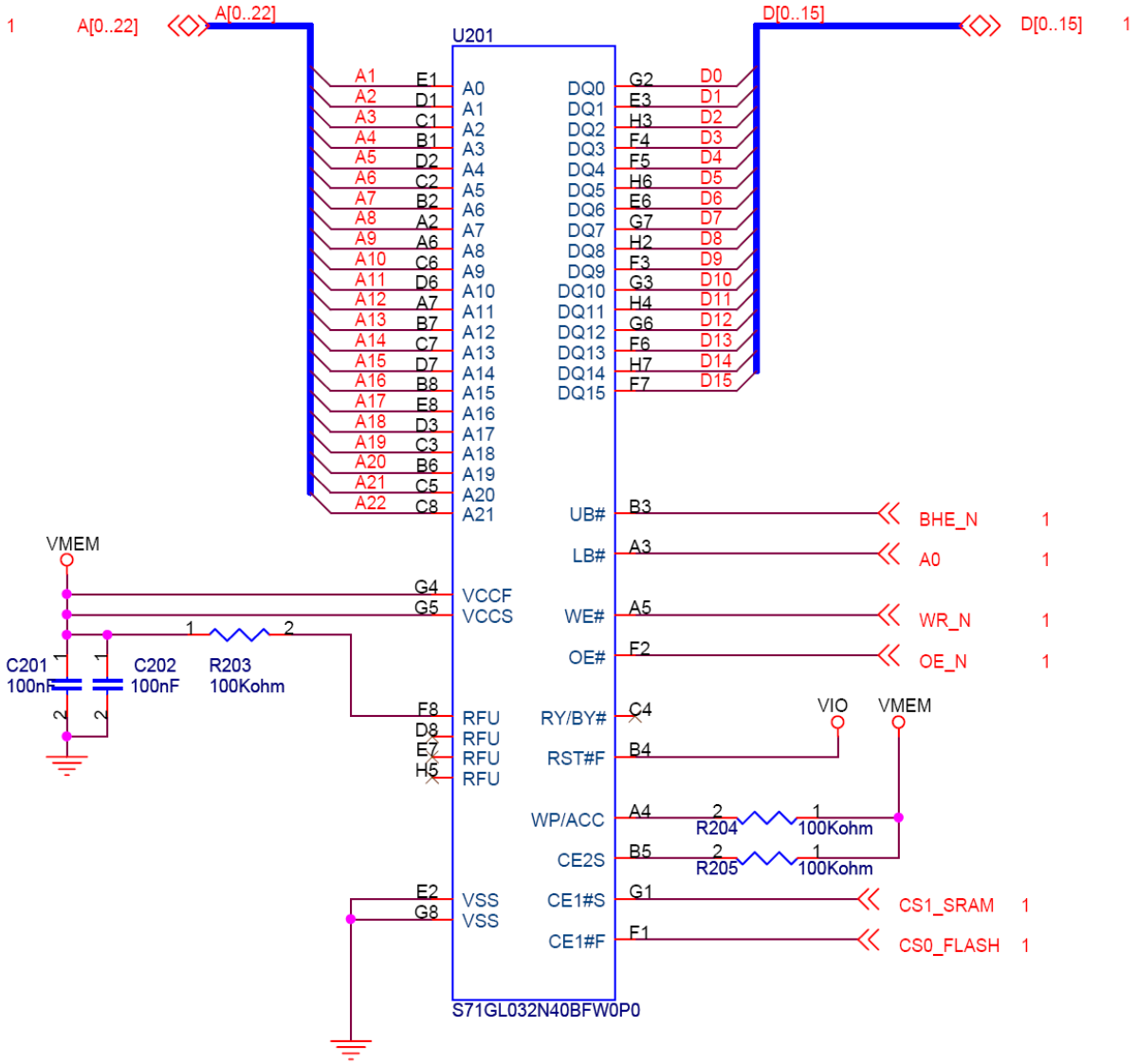


Figure.3-13 Memory Interface

In E-GOLDvoice, the 16bits demultiplex X-bus interface is used for memory device support. NOR Flash memory is supported. (The NAND Flash memory is not supported). The page mode can be supported for flash memories. Up to 8MBytes of external RAM and/or ROM can be connected to the MCU via its external bus interface.

Up to 3 external CS signals can be generated to save external glue logic. Access to very slow memories is supported via a special 'Ready' function. The system MCU clock is set to run with 26Mhz.

3.14 Power Block Interface

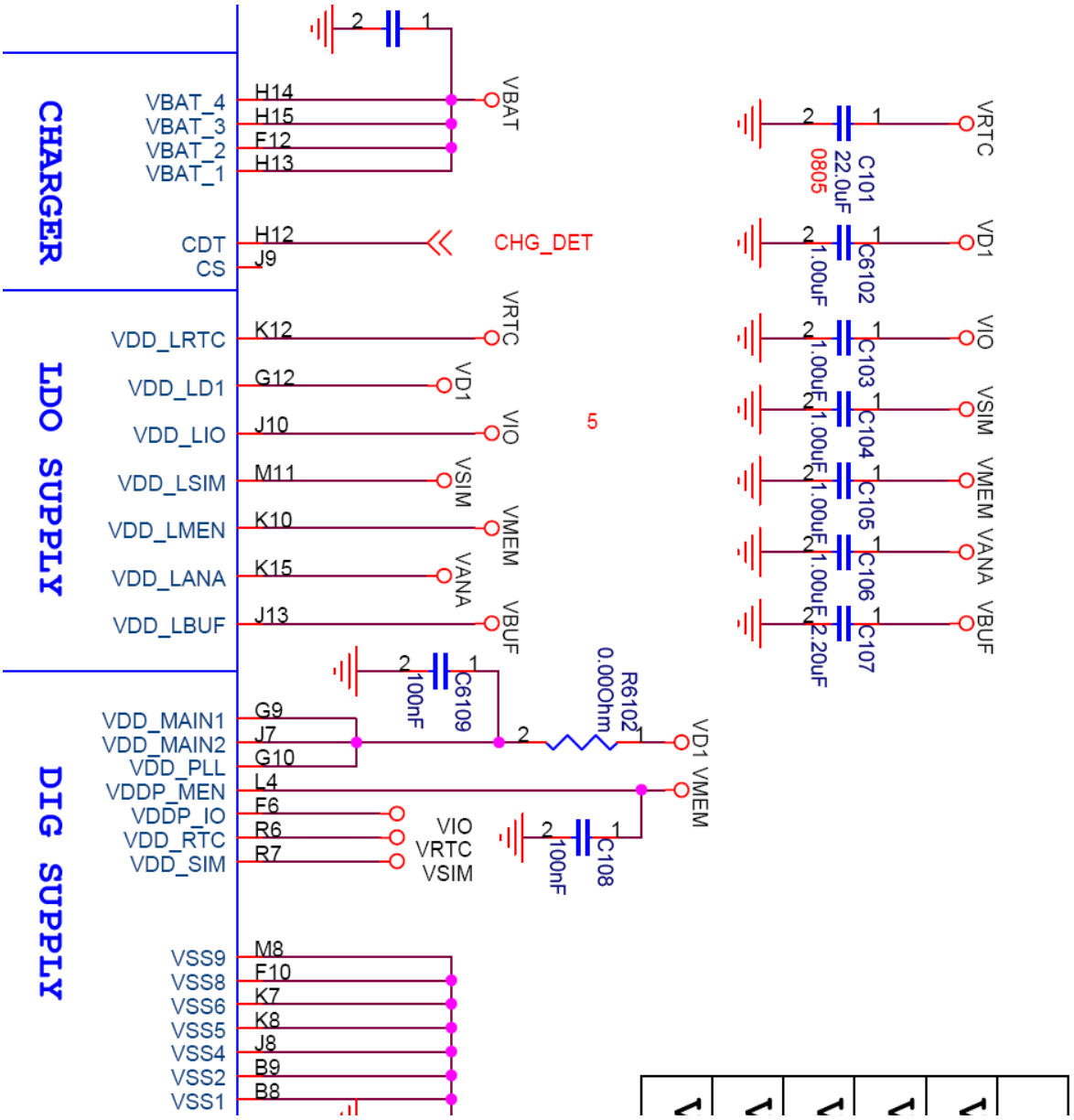


Figure.3-14-1 Power Block Interface

The E-GOLDvoice integrated power management unit (PMU) supports direct connection to battery (DCB), see **Figure 3-1 E-GOLDvoice Block Diagram**. That means all supply voltages needed are generated on-chip with integrated linear voltage regulators. The input of these linear voltage regulators is the battery voltage. The externalmemory and SIM card supply is provided by the on-chip voltage regulators. **Figure.3-14-2** is an overview of the internal generated supply voltages.

Name	Output Voltage(V)	Output Current (mA)	Comment
LRTC	2.0	4	Used for the real time and digital PMU supply
LD1	1.2/1.5	150	Used for the core supplies (MCU and DSP via switch)
LIO	1.8/2.85	30	Used for the I/O pad supply and, for example, the display
LRFXO	2.5	10	Used for the crystal oscillator supply
LMEM	1.8/2.85	100	Used for the external memory supply, voltage can be configured during startup
LANA	2.5	100	Used for analog (audio and baseband processing) and headset driver
LSIM	1.8/2.85	30	Used of the SIM card supply
LBUF	2.6/2.8/3.0/3.2	300	Used for the loudspeaker and earpiece driver
LRFRX	2.5	100	Used for the RF RX part
LRFTRX	1.5	120	Used for the RF TX/TX part

Figure 3-14-2 EGold Voice PMU

The integrated power management also provides the control state machine for system start up, including start up with discharged batteries, pre-charging and system reset control.
After system start up several methods are implemented for active and idle power saving.

LDO output voltage selection

• LD1, LIO, LSIM, LBUF output voltage programmable by software.
• LMEM output voltage is selectable by pin configuration upon startup.

Active and idle power saving options:

• The flexible clock switching options allow minimizing the power consumption during the operation phases of the E-GOLDvoice.
• Current consumption during the standby mode is minimized by reducing the clock to 32 kHz and switching it off for most of the device. In addition, the power supply for the TEAKLite ROM is switched off and the controller RAM is switched to a power saving mode.

Start-up and Reset Control State Machine Features

• Power up upon battery insertion, push button, alarm, charger connection.
• Detection of battery exchange or re-insertion.
• Complete start-up sequence management.
• System turn-on, system turn-off operation management including emergency (under-voltage) and programmed shutdown functions.
• Internal reset of the baseband.
• Tristate function of the baseband module.
• Standby mode controlled by VCXO_EN provided by SCCU module.

3.15 FM Radio Interface (GB105&GB105b&GB106)

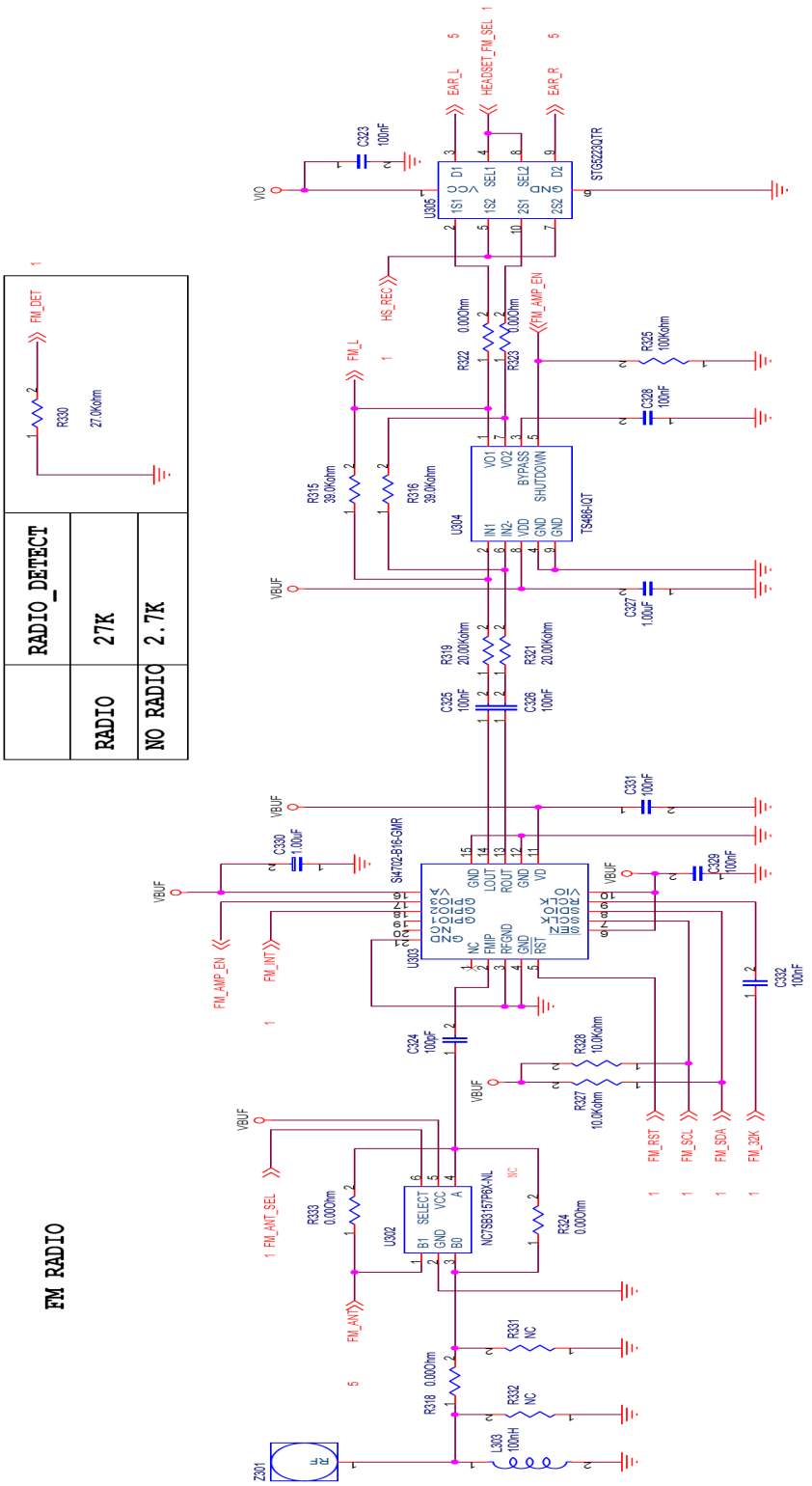


Figure.3-15 FM Radio Interface

3.15.1 FM Tuner (GB105&GB105b&GB106 only)

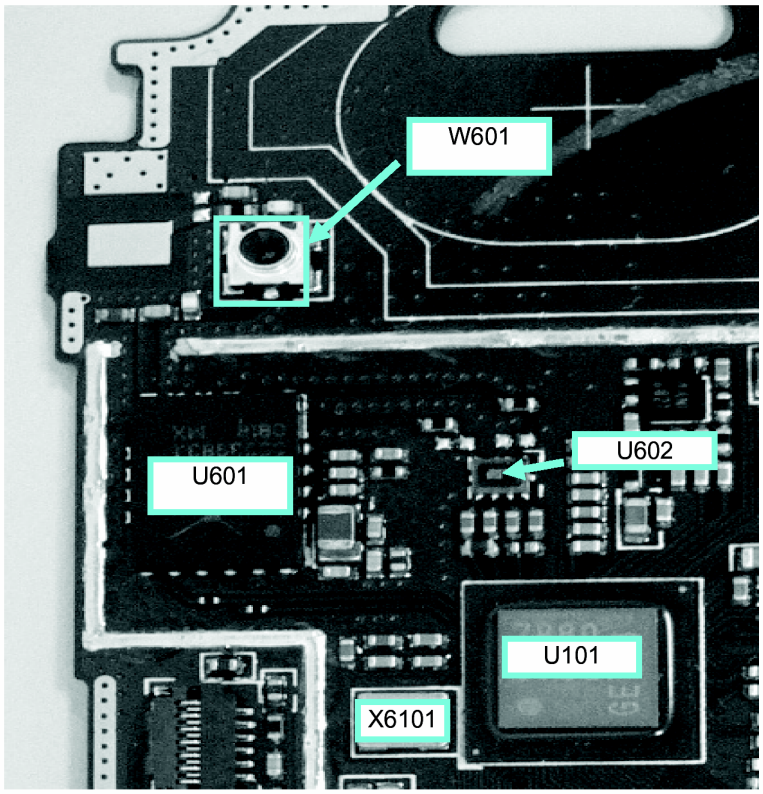
The Si4702 patented digital low-IF architecture reduces external components and eliminates the need for factory adjustments. The receive (RX) section integrates a low noise amplifier (LNA) supporting the worldwide FM broadcast band (76 to 108 MHz). Anautomatic gain control (AGC) circuit controls the gain of the LNA to optimize sensitivity and rejection of strong interferers.
For two-wire operation, a transfer begins with the START condition. The control word is latched internally on rising SCLK edges and is eight bits in length, comprised of a seven bit device address equal to 0010000b and a read/write bit (write = 0 and read = 1). The device acknowledges the address by setting SDIO low on the next falling SCLK edge. For write operations, the device acknowledge is followed by an eight bit data word latched internally on rising edges of SCLK. The device always acknowledges the data by setting SDIO low on the next falling SCLK edge. An internal address counter automatically increments to allow continuous data byte writes, starting with the upper byte of register 02h, followed by the lower byte of register 02h, and onward until the lower byte of the last register is reached. The internal address counter then automatically wraps around to the upper byte of register 00h and proceeds from there until continuous writes cease. Data transfer ceases with the STOP command. After every STOP command, the internal address counter is reset. For read operations, the device acknowledge is followed by an eight bit data word shifted out on falling SCLK edges. An internal address counter automatically increments to allow continuous data byte reads, starting with the upper byte of register 0Ah, followed by the lower byte of register 0Ah, and onward until the lower byte of the last register is reached. The internal address counter then automatically wraps around to the upper byte of register 00h and proceeds from there until continuous reads cease. After each byte of data is read, the controller IC should return an acknowledge if an additional byte of data will be requested. Data transfer ceases with the STOP command. After every STOP command, the internal address counter is reset.

3.15.2 Headphone Amplifier

The TS486 is a dual audio power amplifier capable of driving, in single-ended mode, either a 16 or a 32W stereo headset. Capable of descending to low voltages, it delivers up to 90mW per channel (into 16W loads) of continuous average power with 0.3% THD+N in the audio bandwitdth from a 5V power supply. An externally-controlled standby mode reduces the supply current to 10nA (typ.). The unity gain stable TS486 can be configured by external gain-setting resistors or used in a fixed gain version.

4. TROUBLE SHOOTING

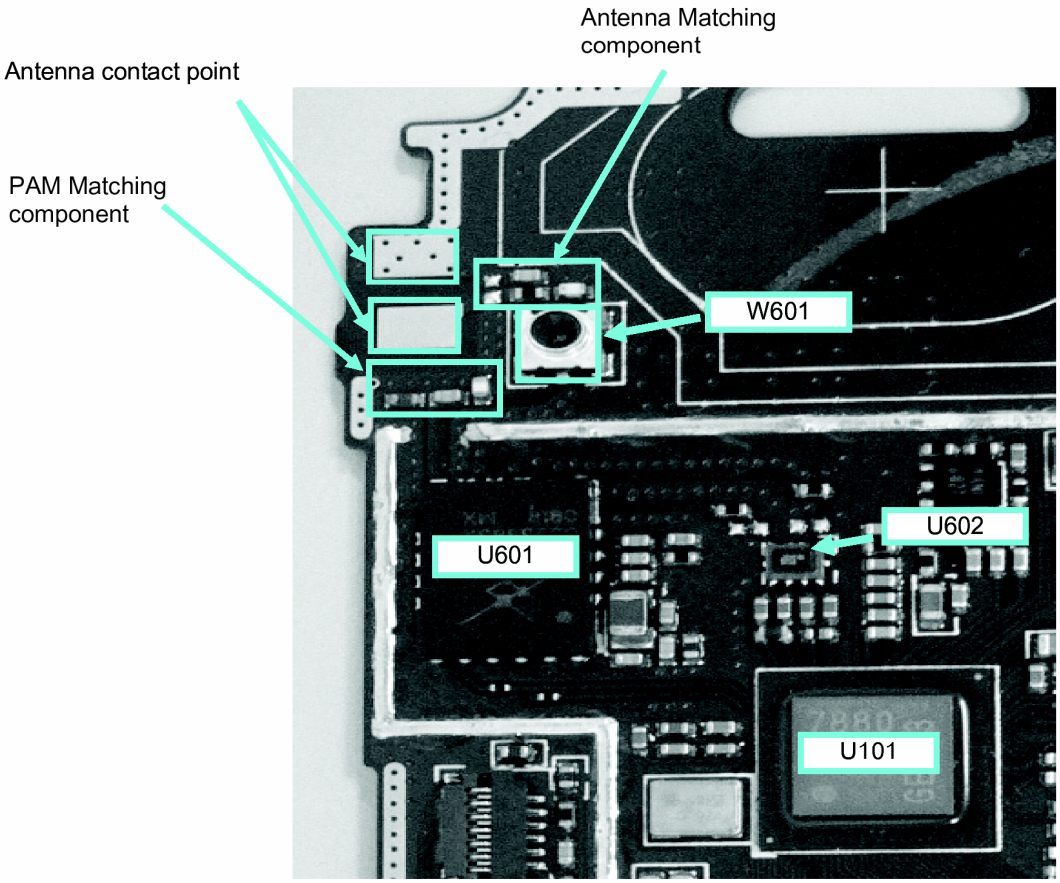
4.1 RF Trouble



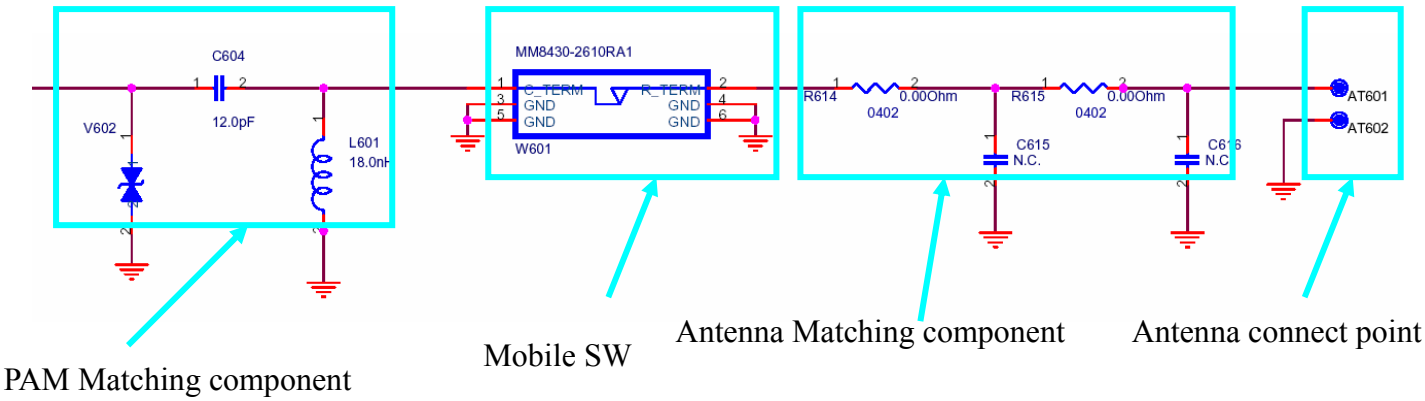
REFERENCE	PART Description
U601	PAM (Power Amp. Module+ASM)
X6101	DCXO (26MHz)
W601	Mobile Switch
U602	RX SAW Filter

RF Trouble

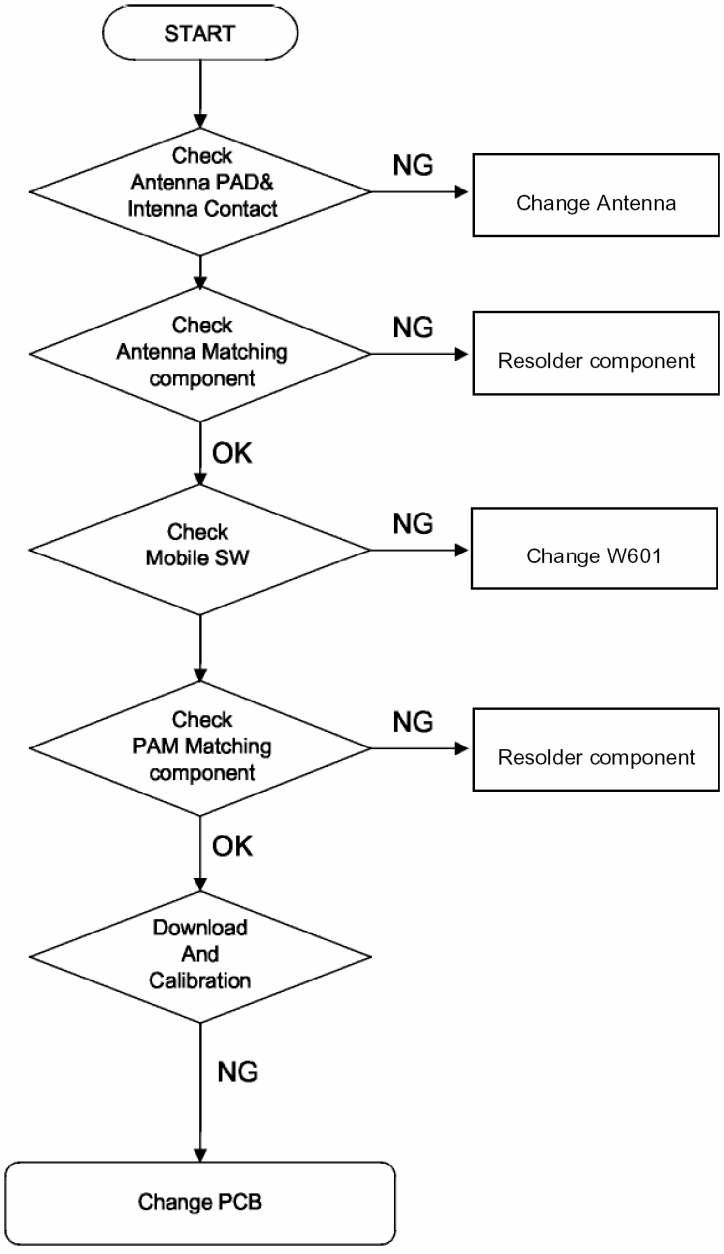
TEST POINT



CIRCUIT

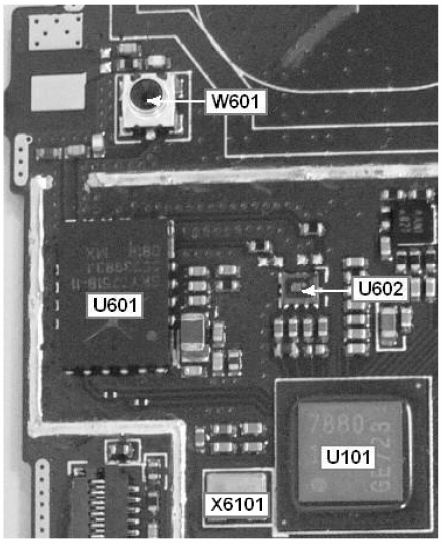


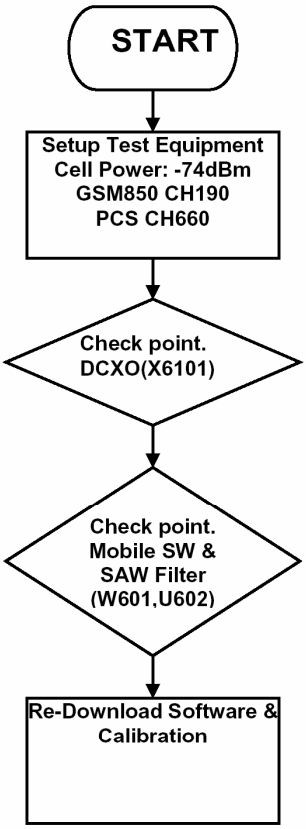
CHECKING FLOW



RX Trouble

TEST POINT	CHECKING FLOW

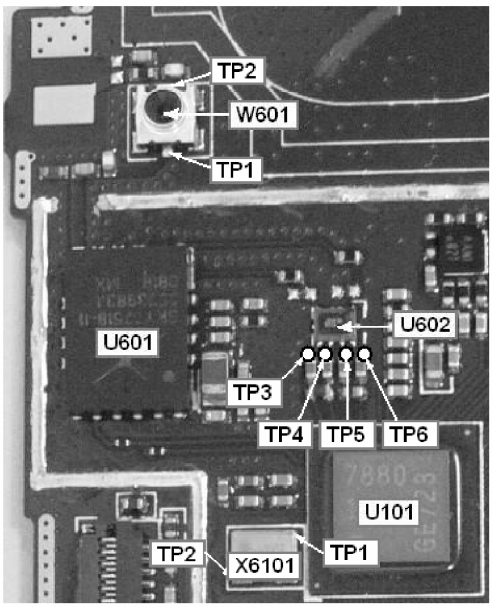


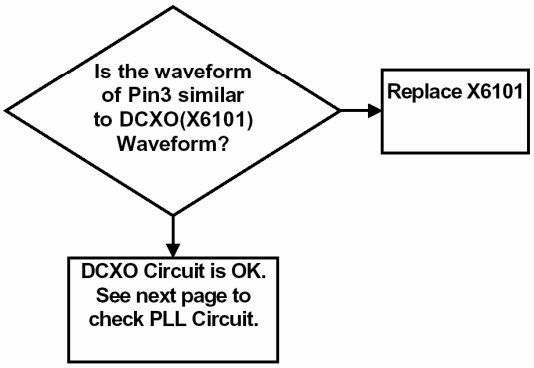


RX Trouble

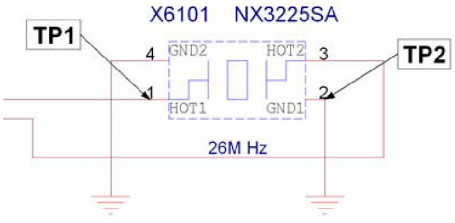
(1) Checking VCTCXO Circuit

TEST POINT	CHECKING FLOW

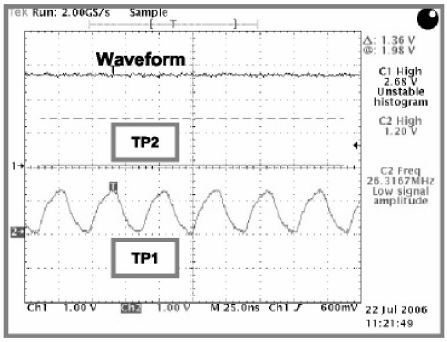




CIR CUIT

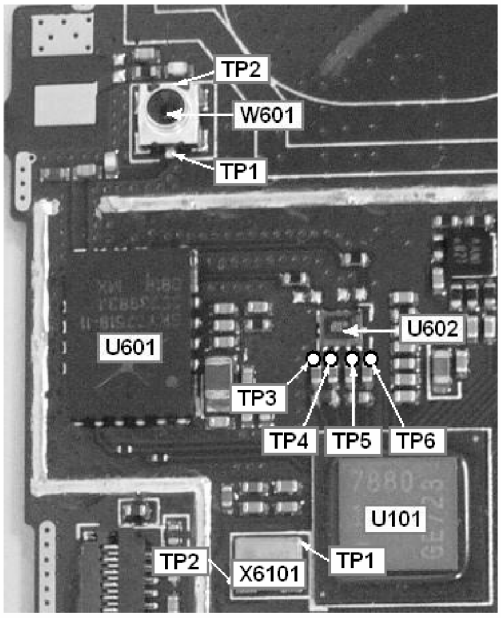


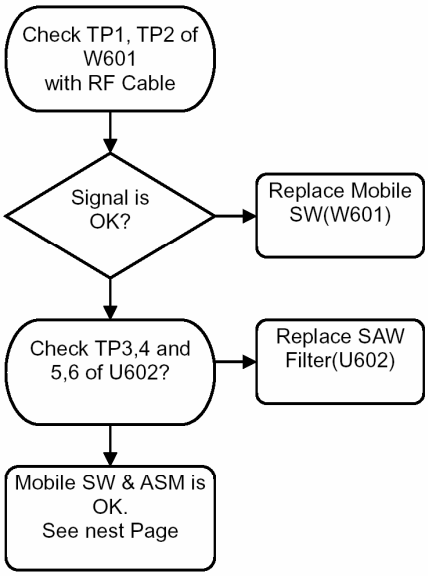
WAVE FORM



RX Trouble

TEST POINT	CHECKING FLOW

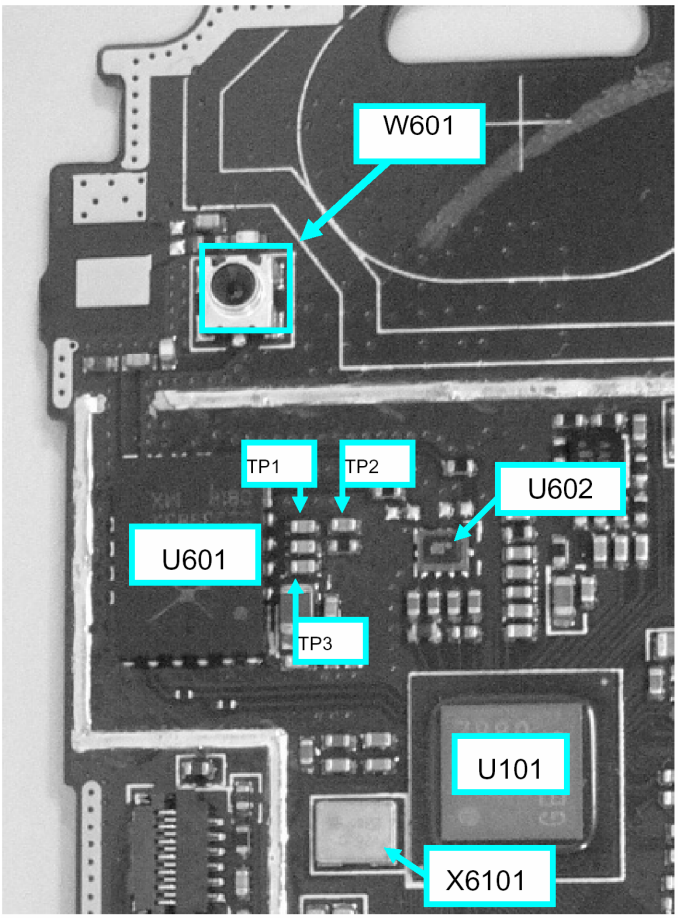




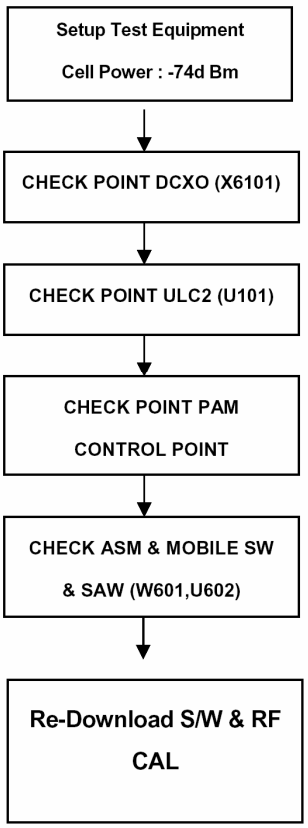
*** TP 3, 4 and 5, 6 outputs of U602 are balanced**

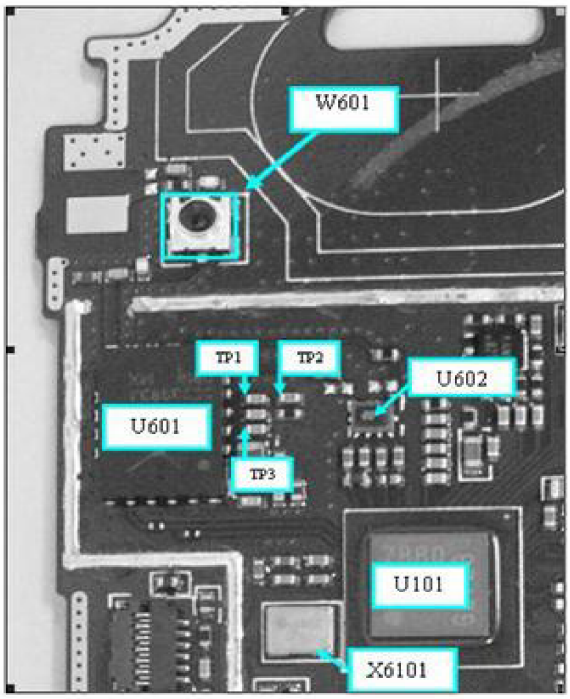
4.2 TX Trouble

TEST POINT

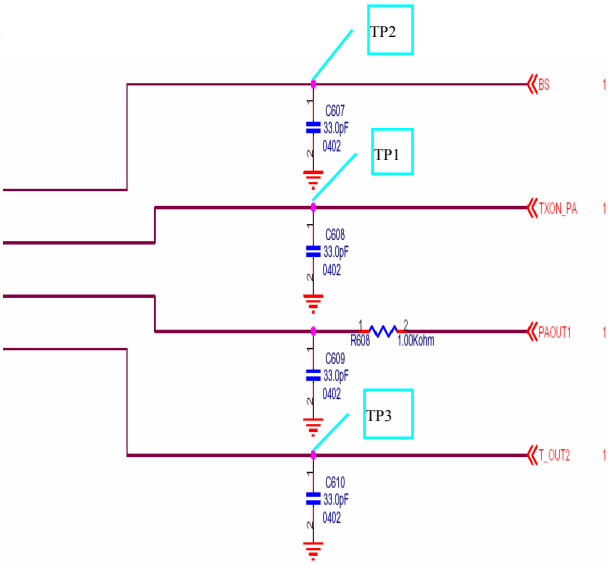


CHECKING FLOW



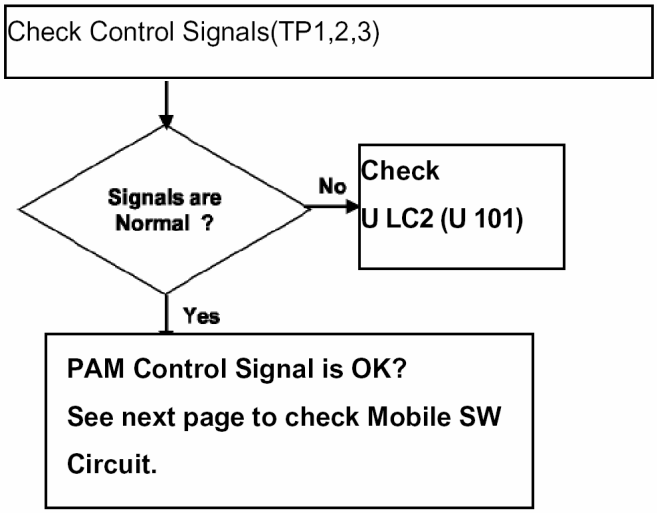


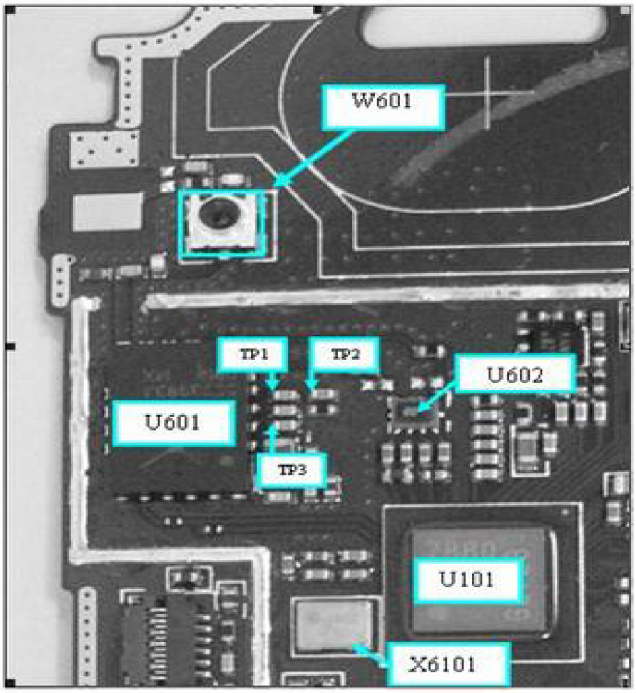
Signal configuration

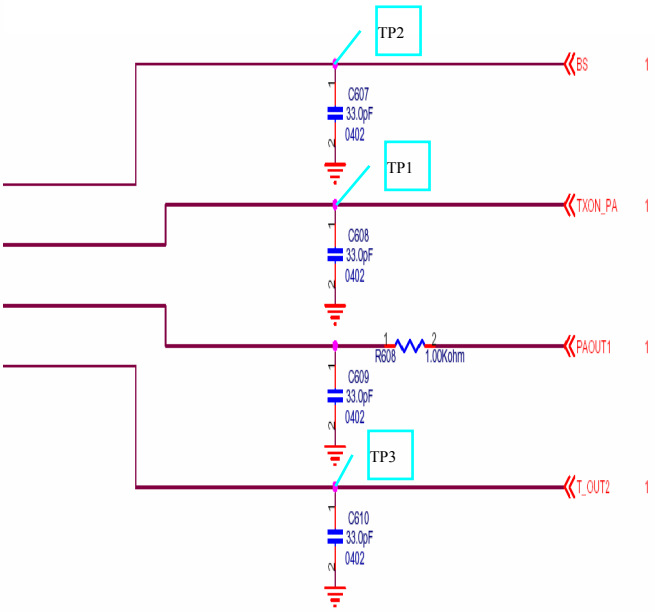


CHECKING FLOW

Mode	GSM850 TX	PCS1900 TX
TXON_PA (TP1)	H(2.7V)	H(2.7V)
BS (TP2)	L	H(2.7V)
VLOGIC (TP3)	H(2.7V)	H(2.7V)



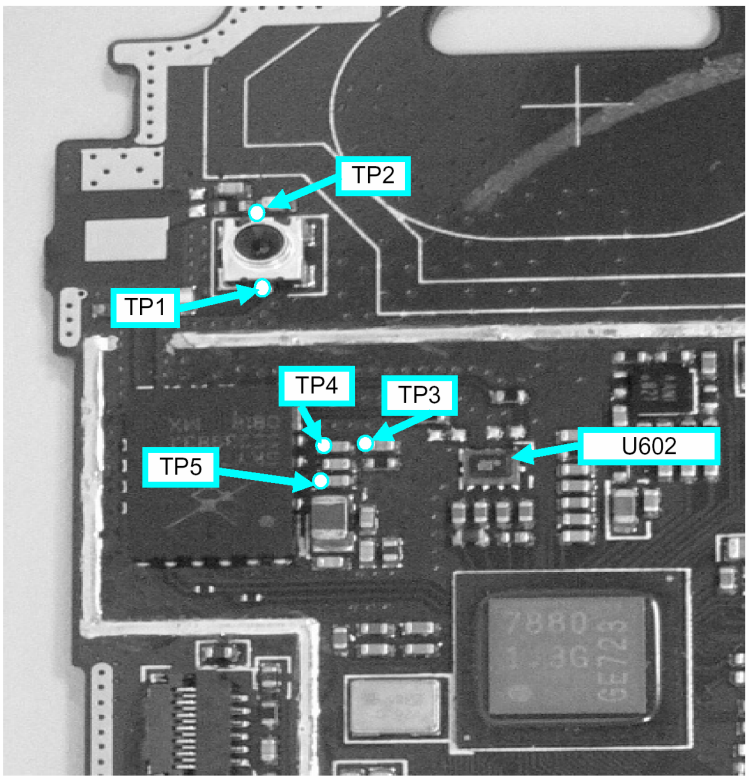


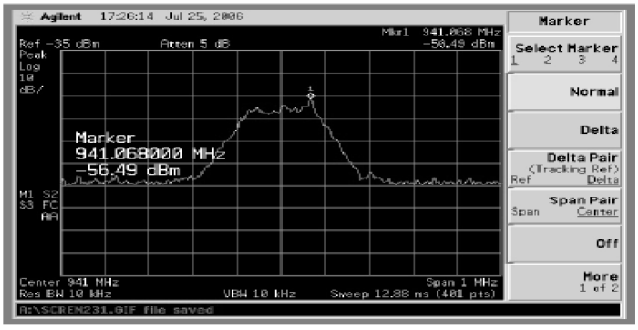


Mode	GSM850 TX	PCS1900 TX	GSM850 RX	PCS1900 RX
TXON_PA (TP1)	**H(2.7V)**	**H(2.7V)**	**L**	**L**
BS (TP2)	**L**	**H(2.7V)**	**L**	**H(2.7V)**
VLOGIC (TP3)	**H(2.7V)**	**H(2.7V)**	**H(2.7V)**	**H(2.7V)**

RF Trouble

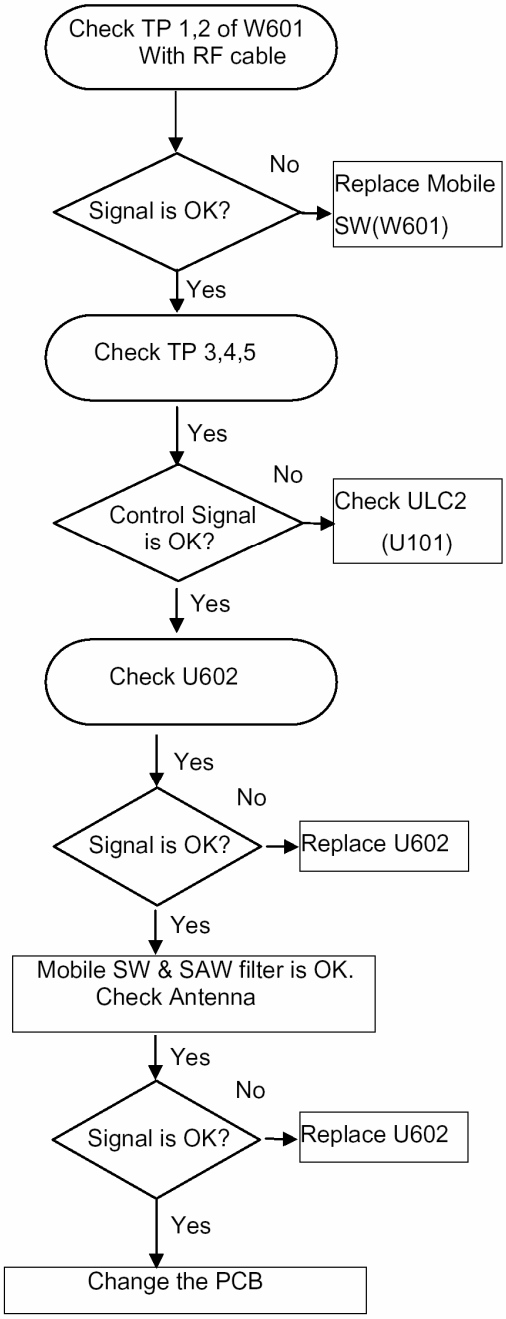
TEST POINT





Mode	GSM850 RX	PCS1900 RX
VLOGIC (TP3)	H(2.7V)	H(2.7V)
TXON_PA (TP4)	L	L
BS(TP5)	L	H(2.7V)

CHECKING FLOW



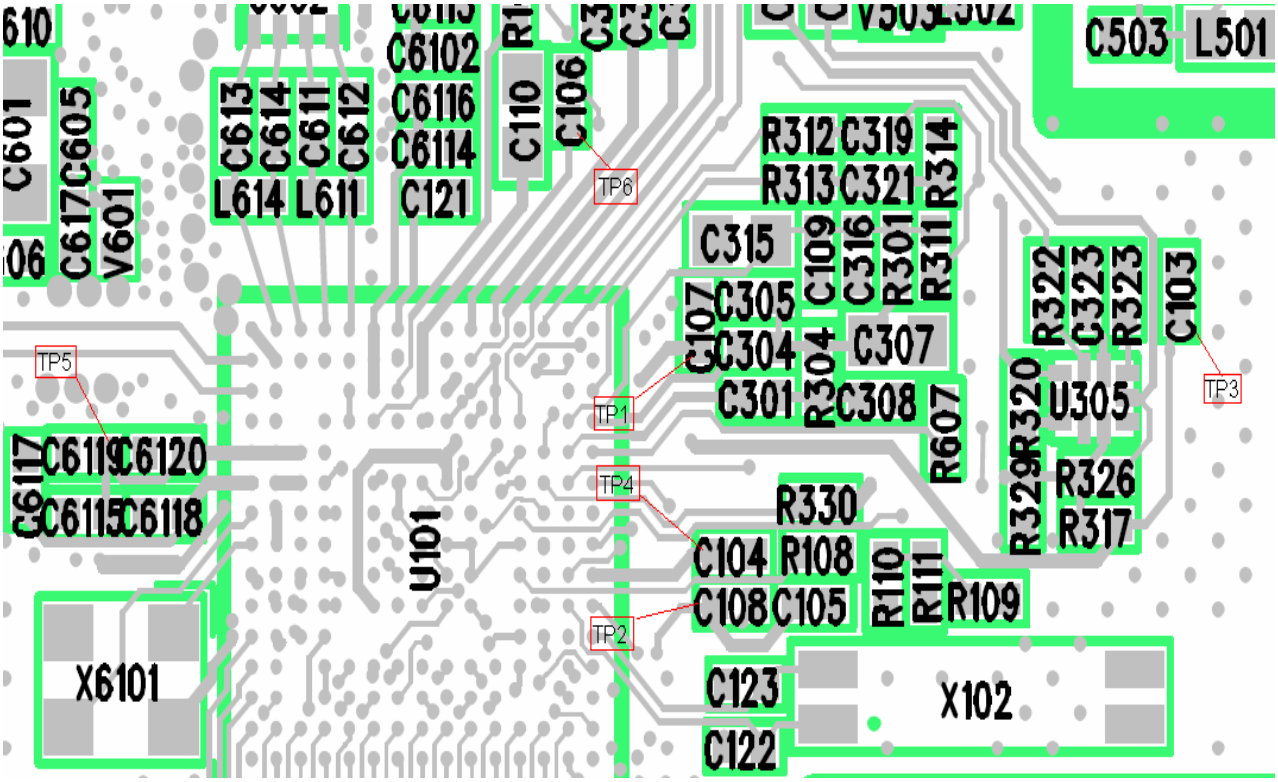
4 .3 Power On Trouble

Test Point

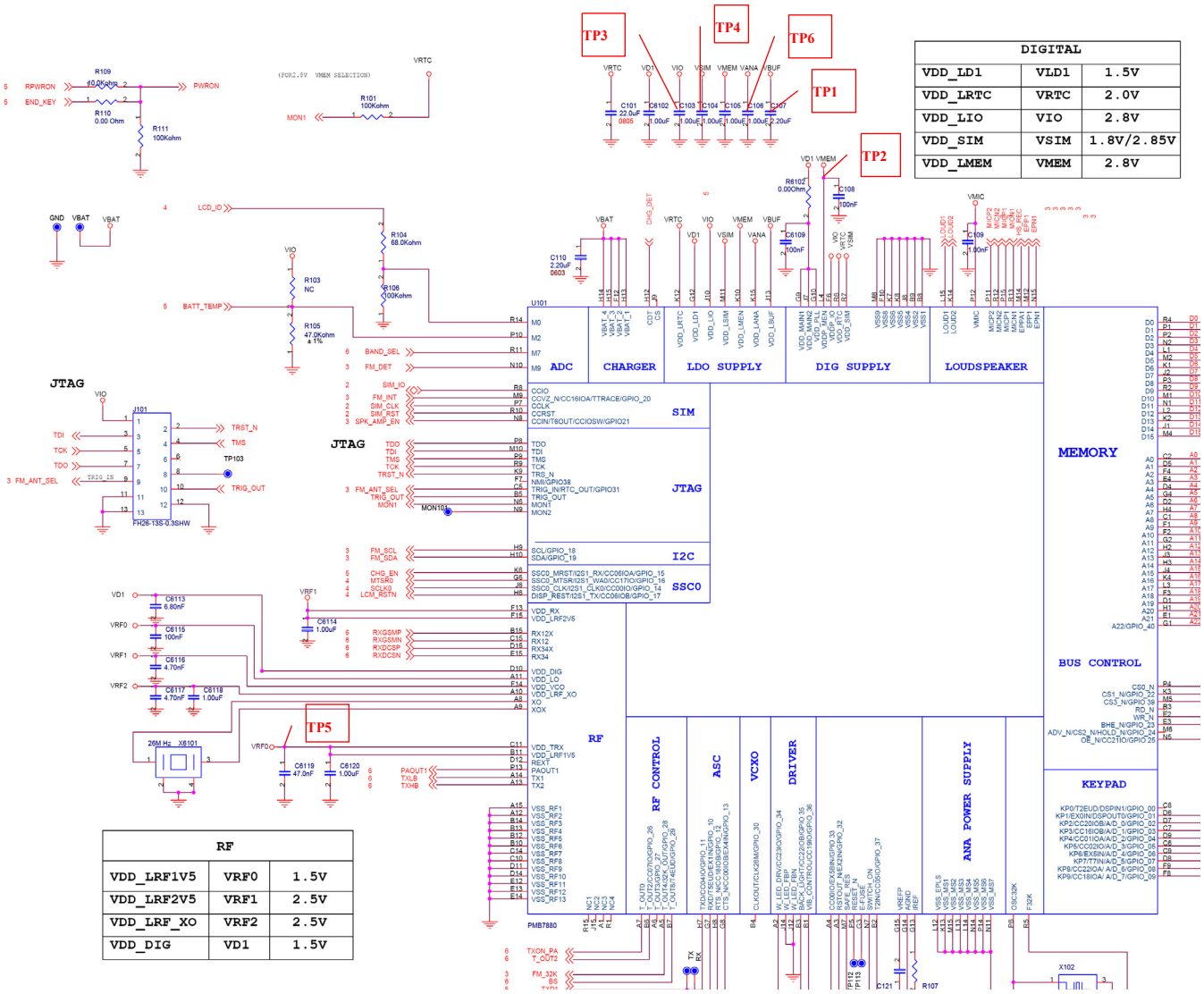
Check Points :

- Battery Voltage(Need to over 3.35V)
- Power-On key detection(PWRON signal)
- Outputs of LDOs U101(EGV)

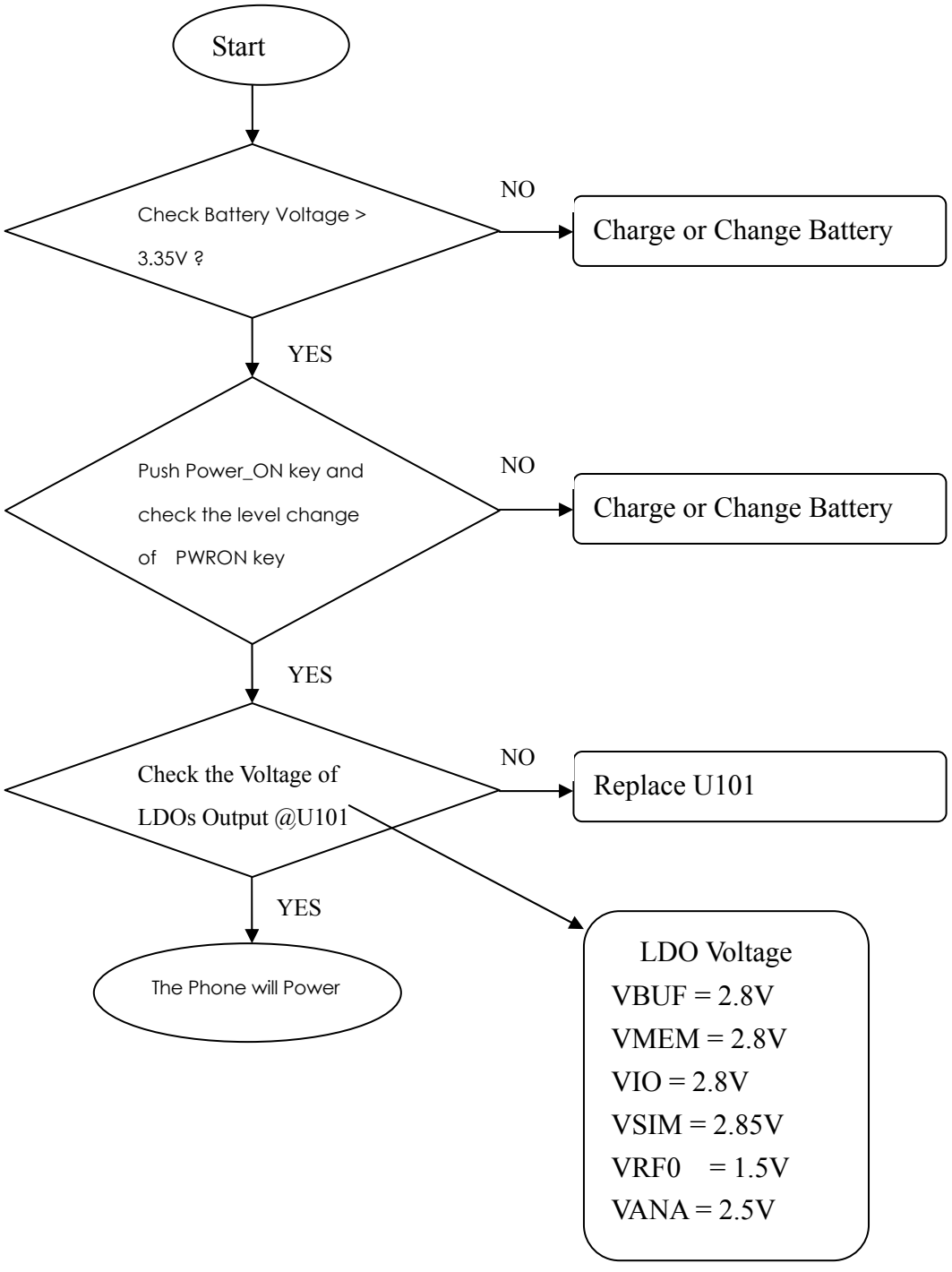
	Voltage	PART
VBUF	2.8V	TP1
VMEM	2.8V	TP2
VIO	2.8V	TP3
VSIM	2.85V	TP4
VRF0	1.5V	TP5
VANA	2.5V	TP6



Circuit Diagram

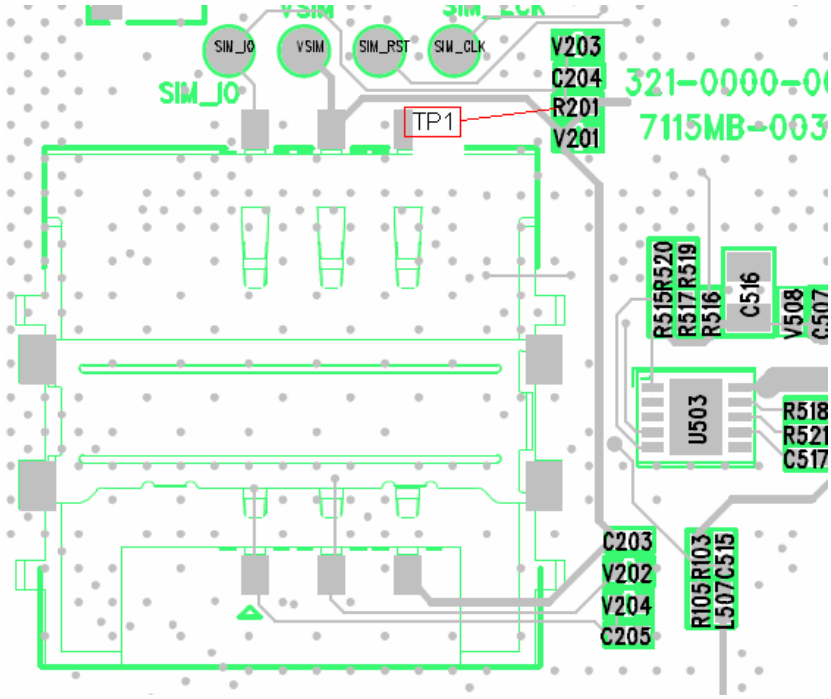


Checking Flow

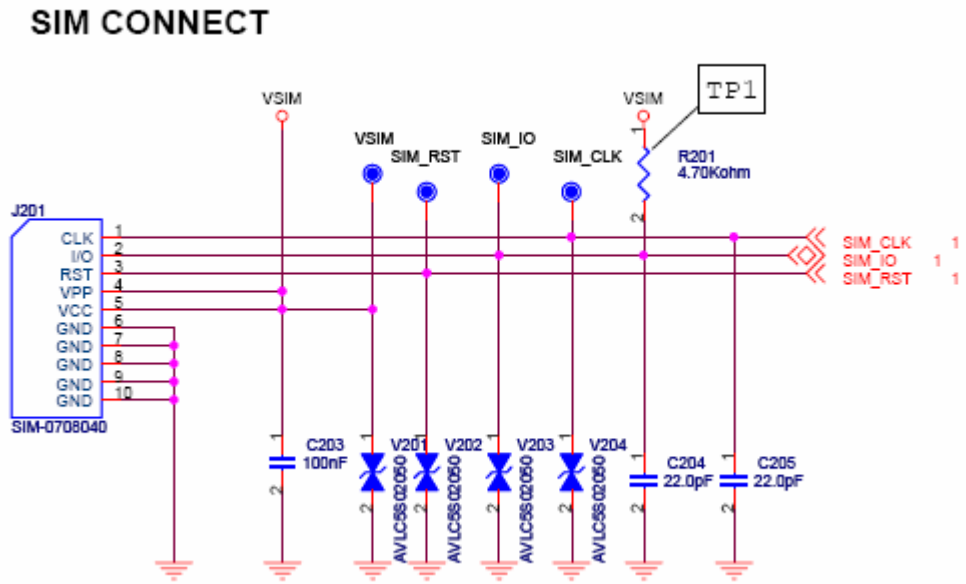


4.4 SIM Card Trouble

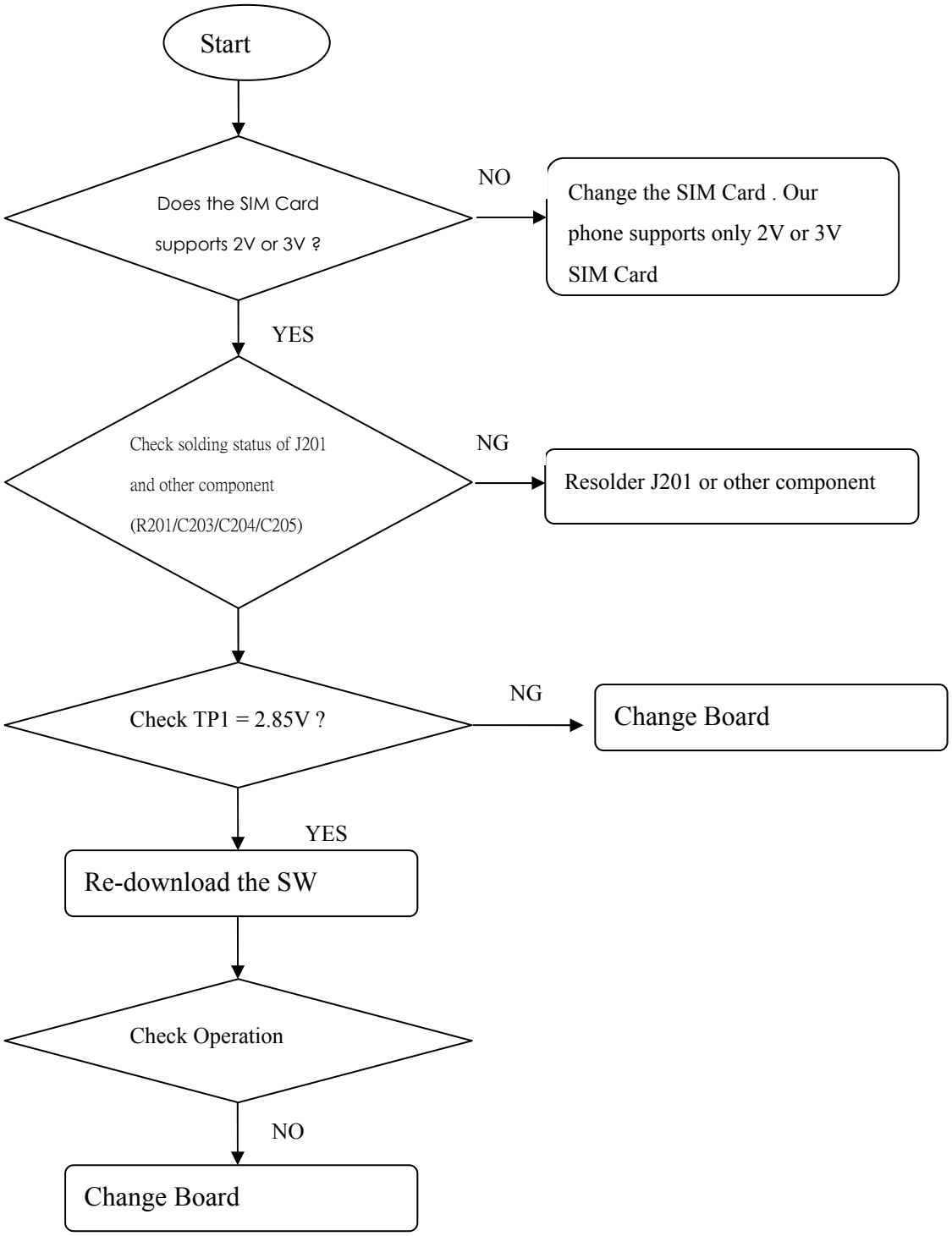
Test Point



Circuit Diagram

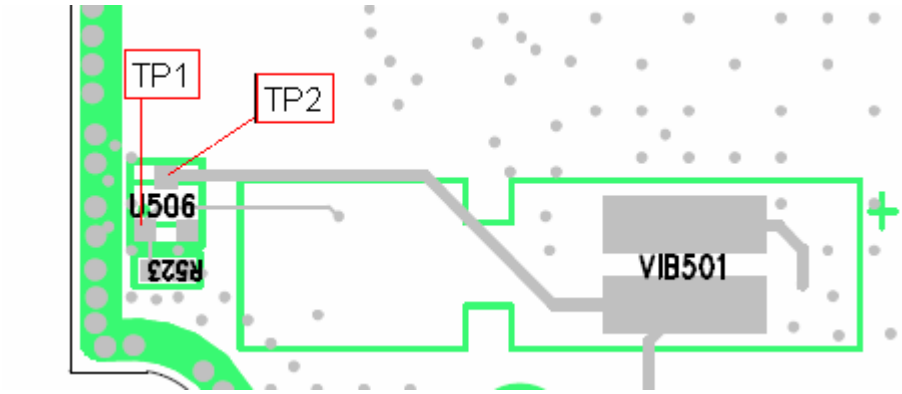


Checking Flow

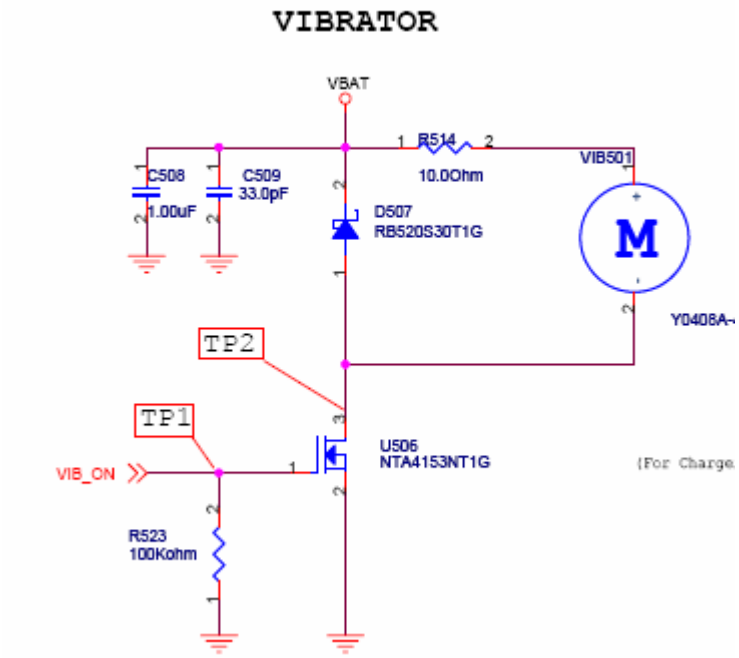


4.5 Vibrator Trouble

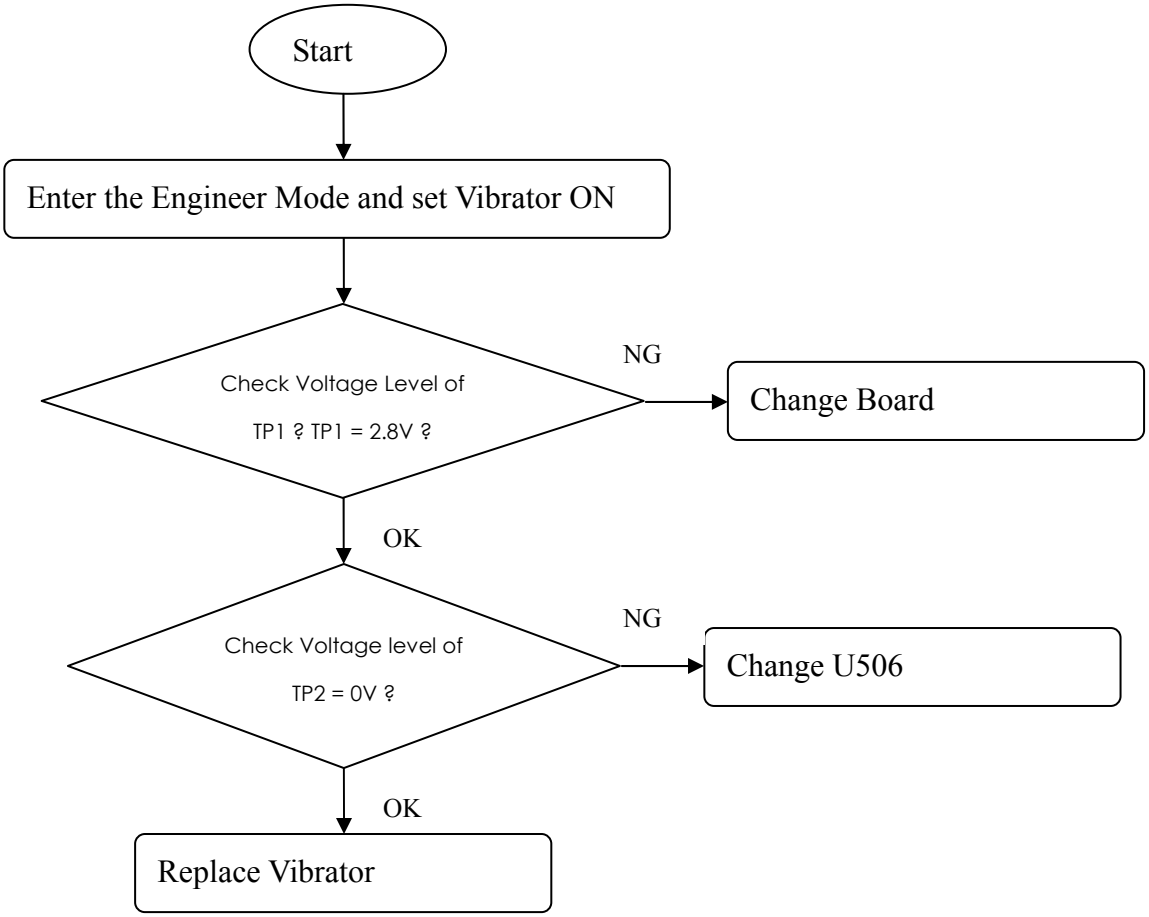
Test Point



Circuit Diagram

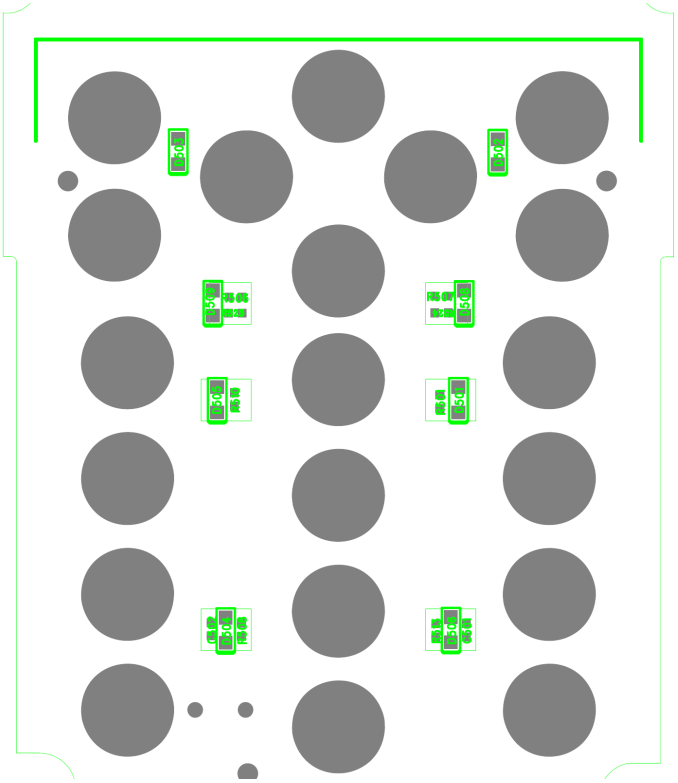


Checking Flow

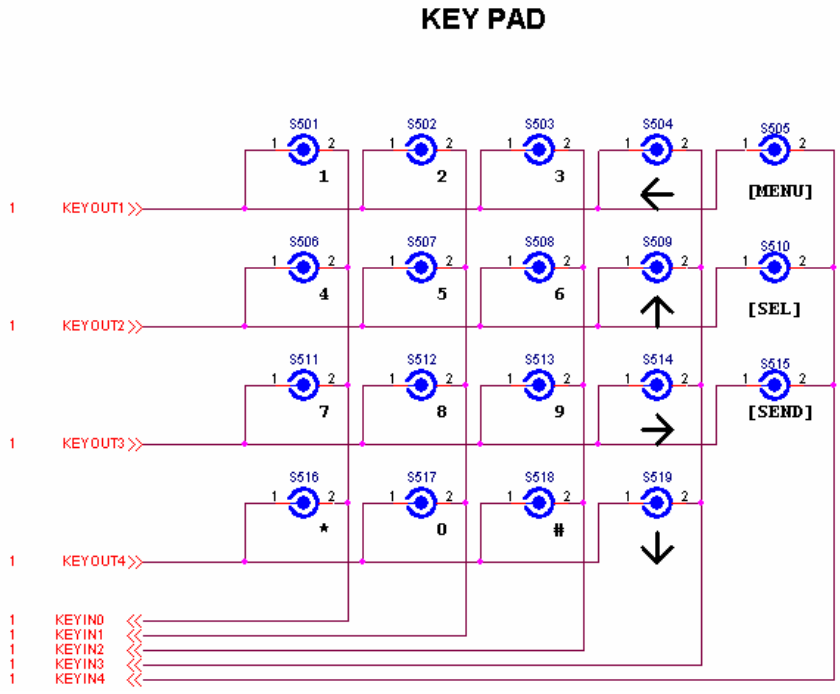


4.6 Keypad Trouble

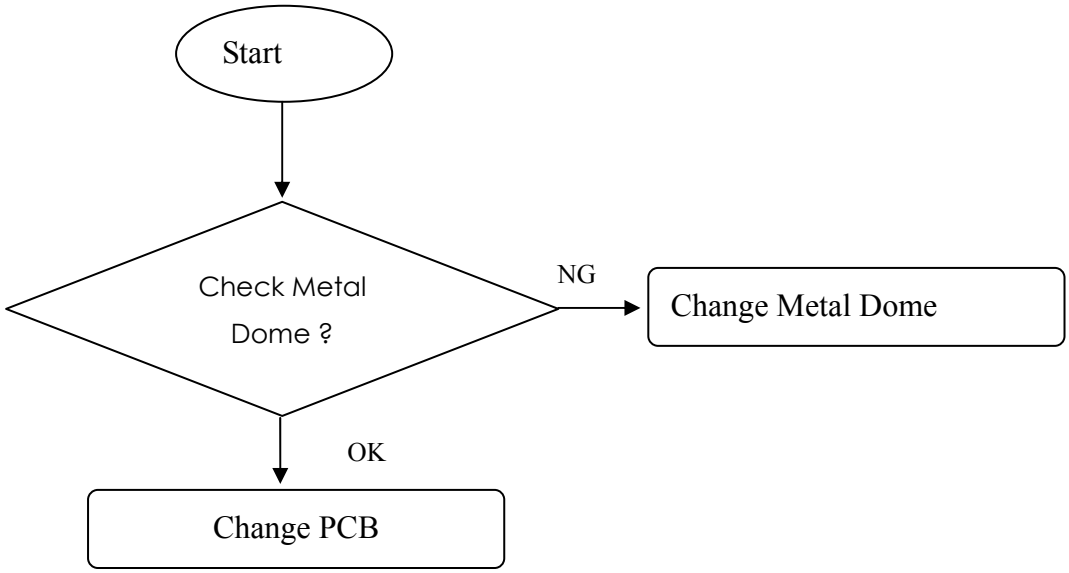
Test Point



Circuit Diagram

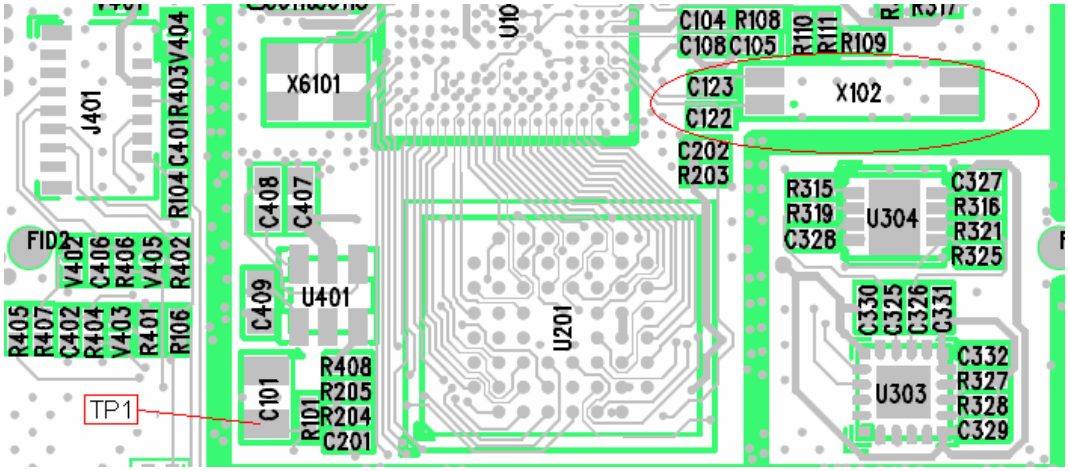


Checking Flow

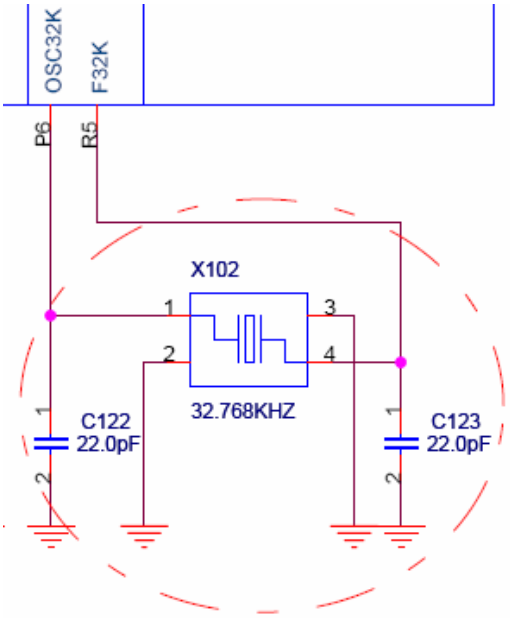


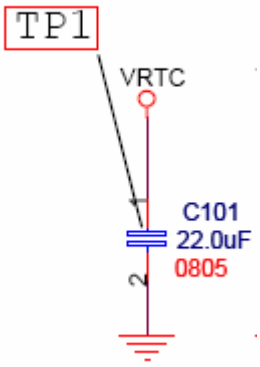
4.7 RTC Trouble

Test Point

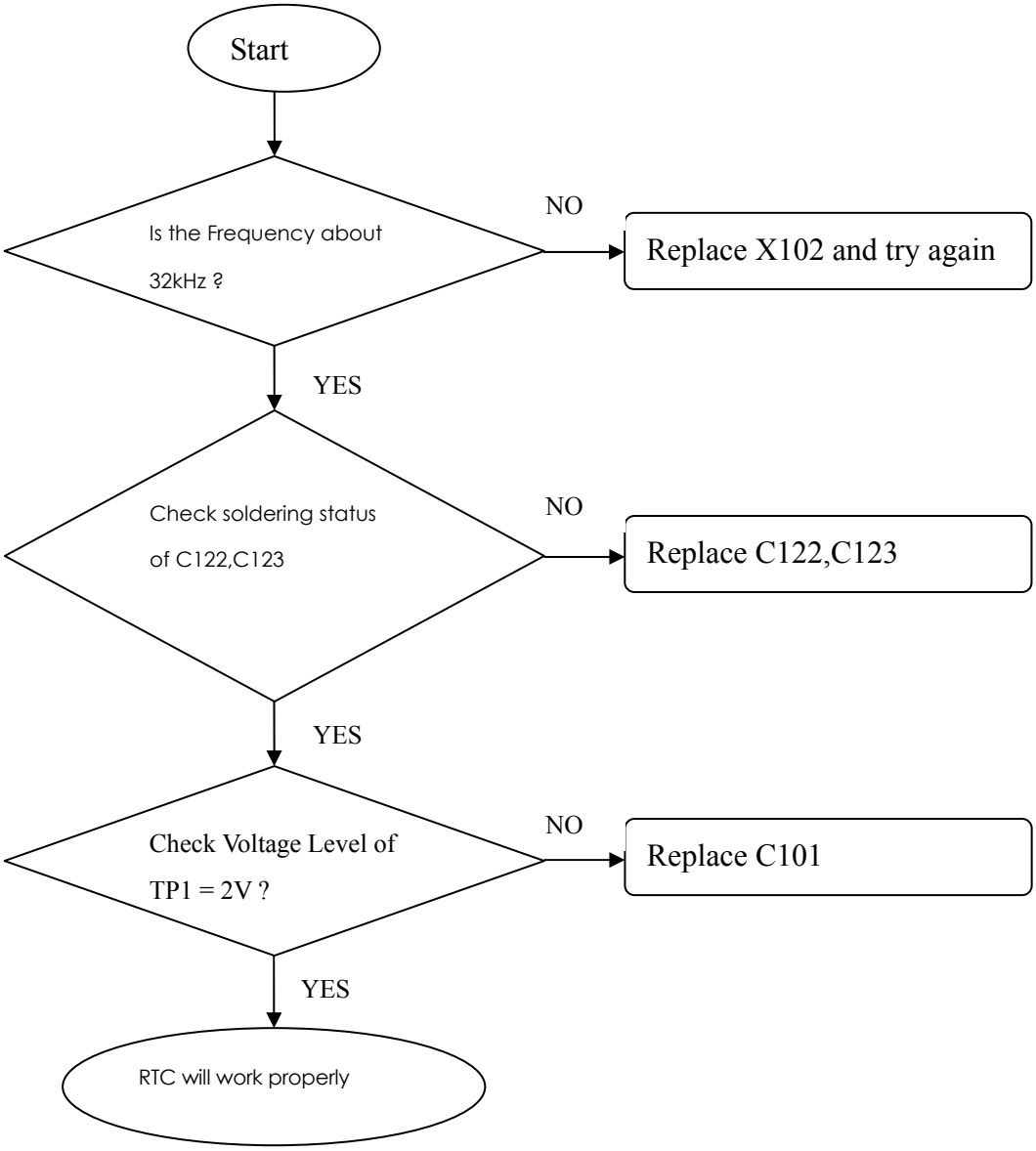


Circuit Diagram



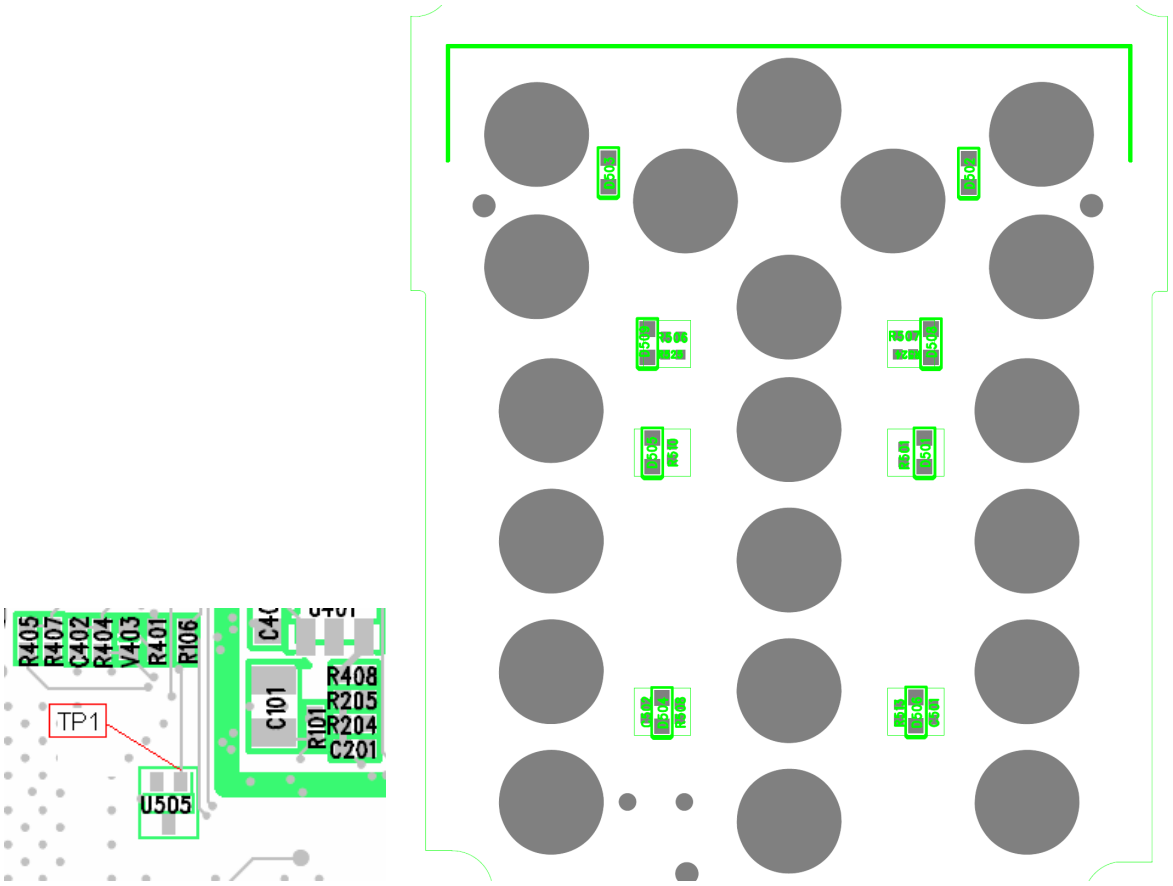


Checking Flow

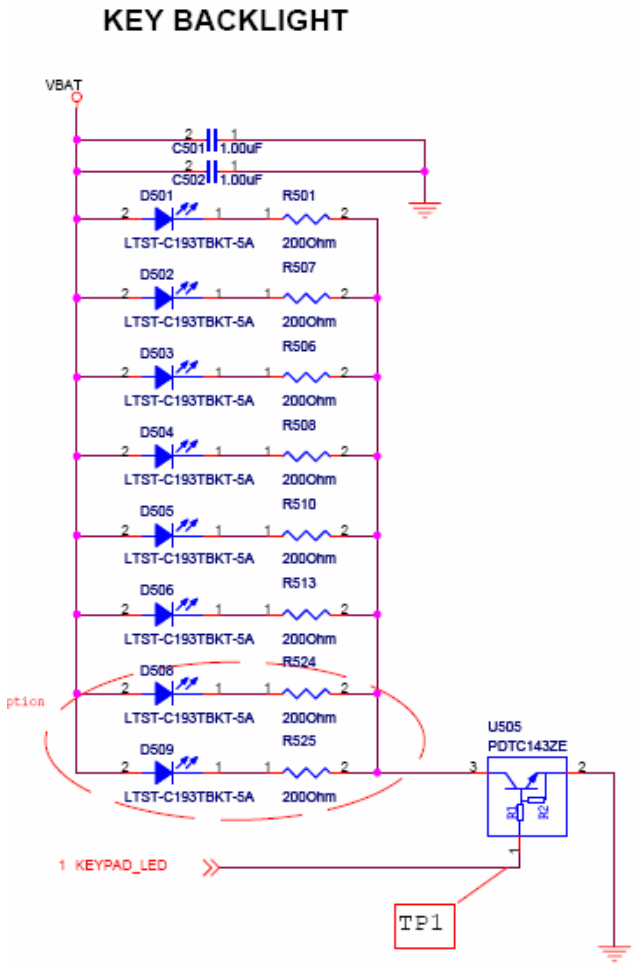


4.8 Key Backlight Trouble

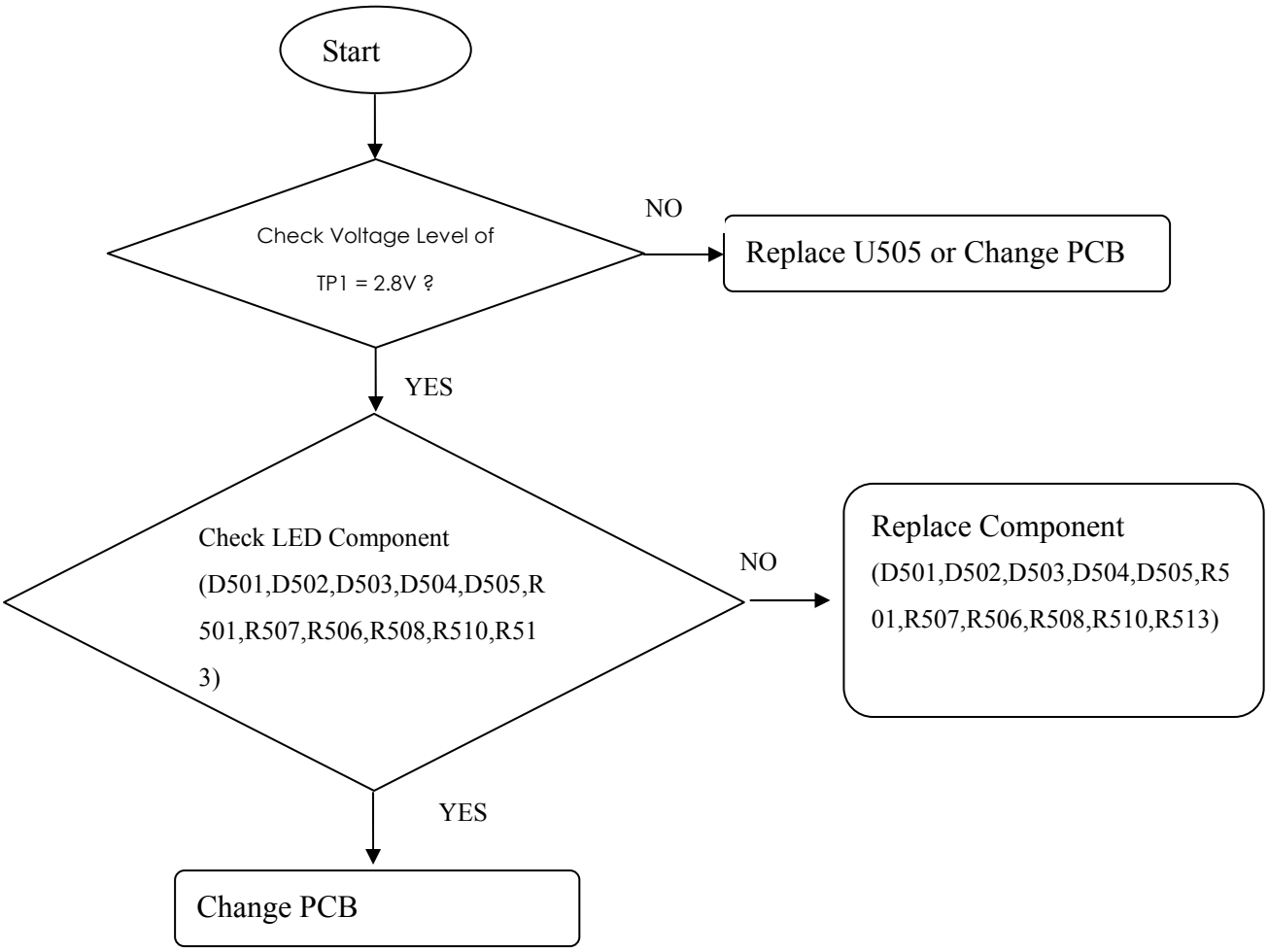
Test Point



Circuit Diagram

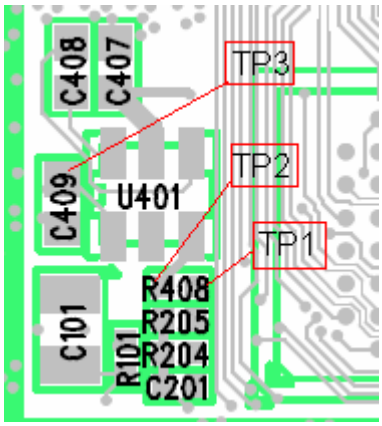


Checking Flow

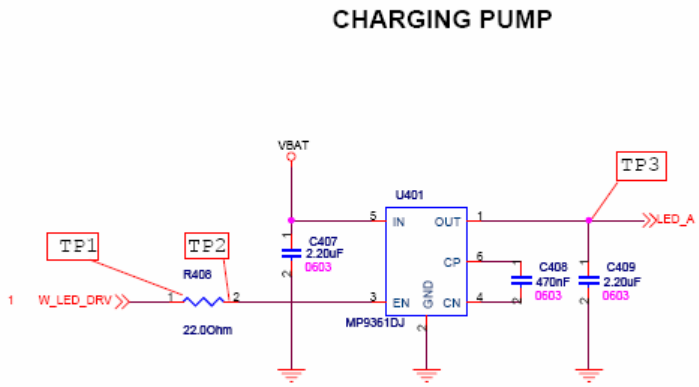


4.9 LCM Backlight Trouble

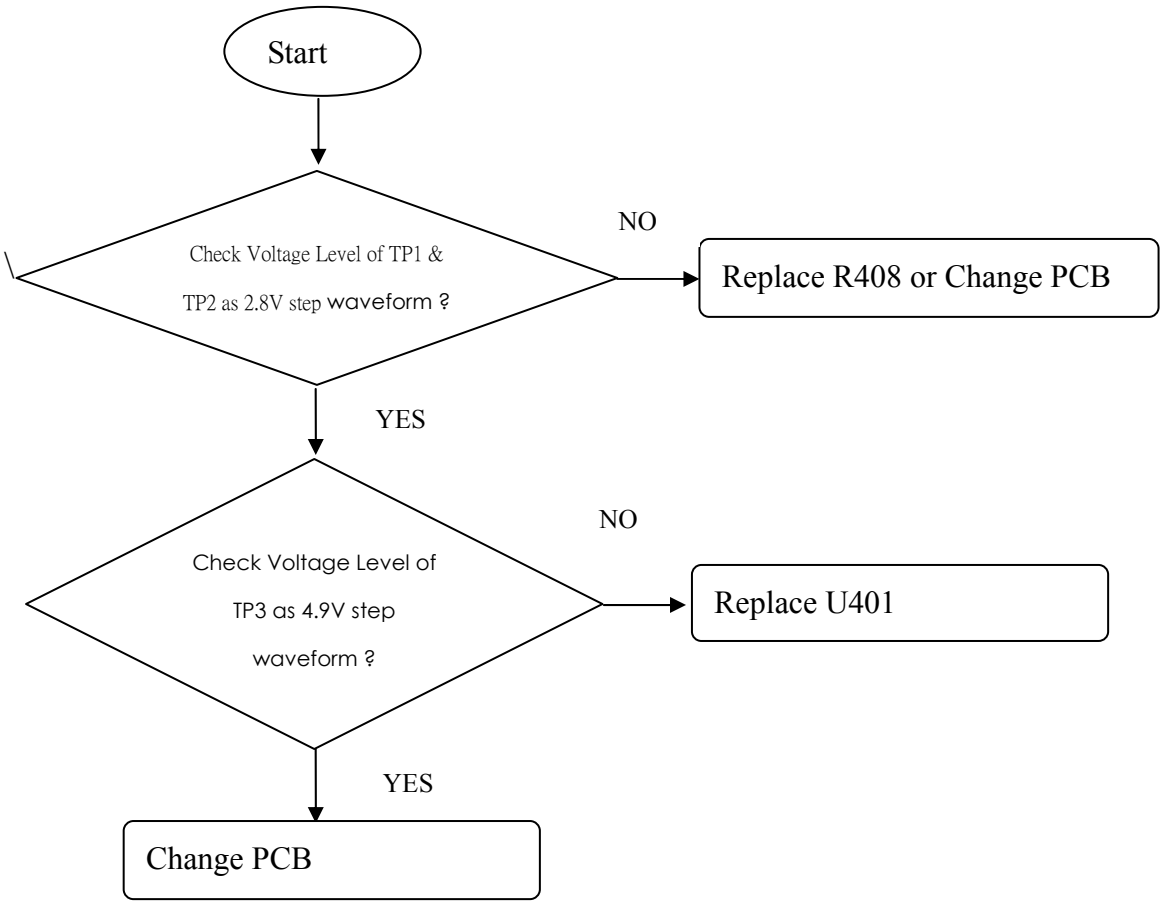
Test Point



Circuit Diagram

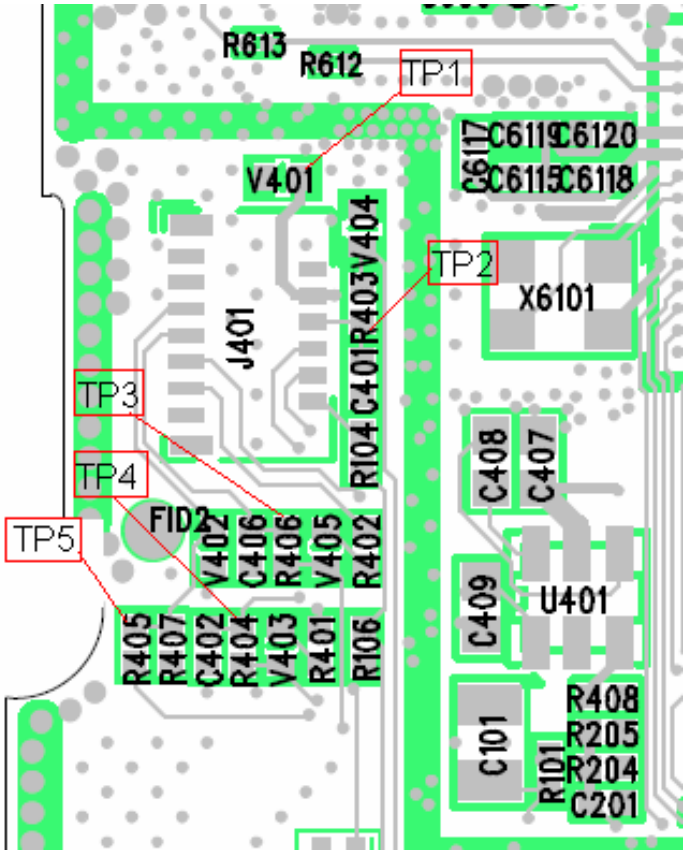


Checking Flow

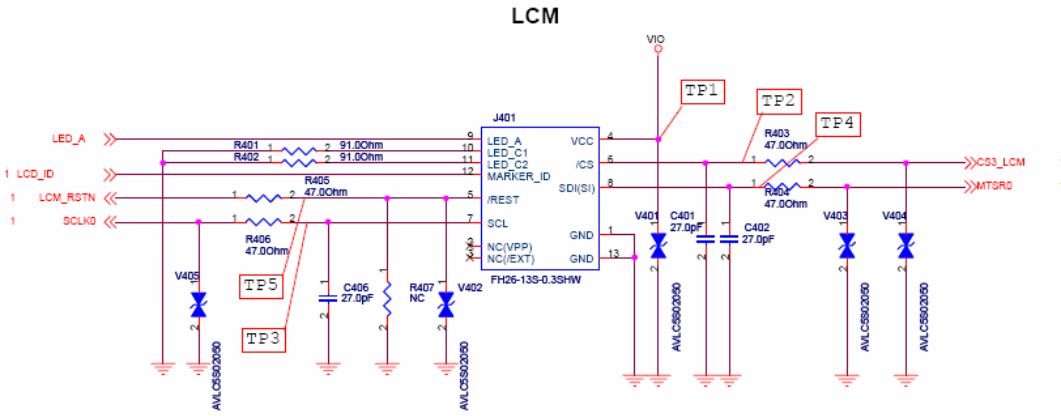


4.10 LCM Trouble

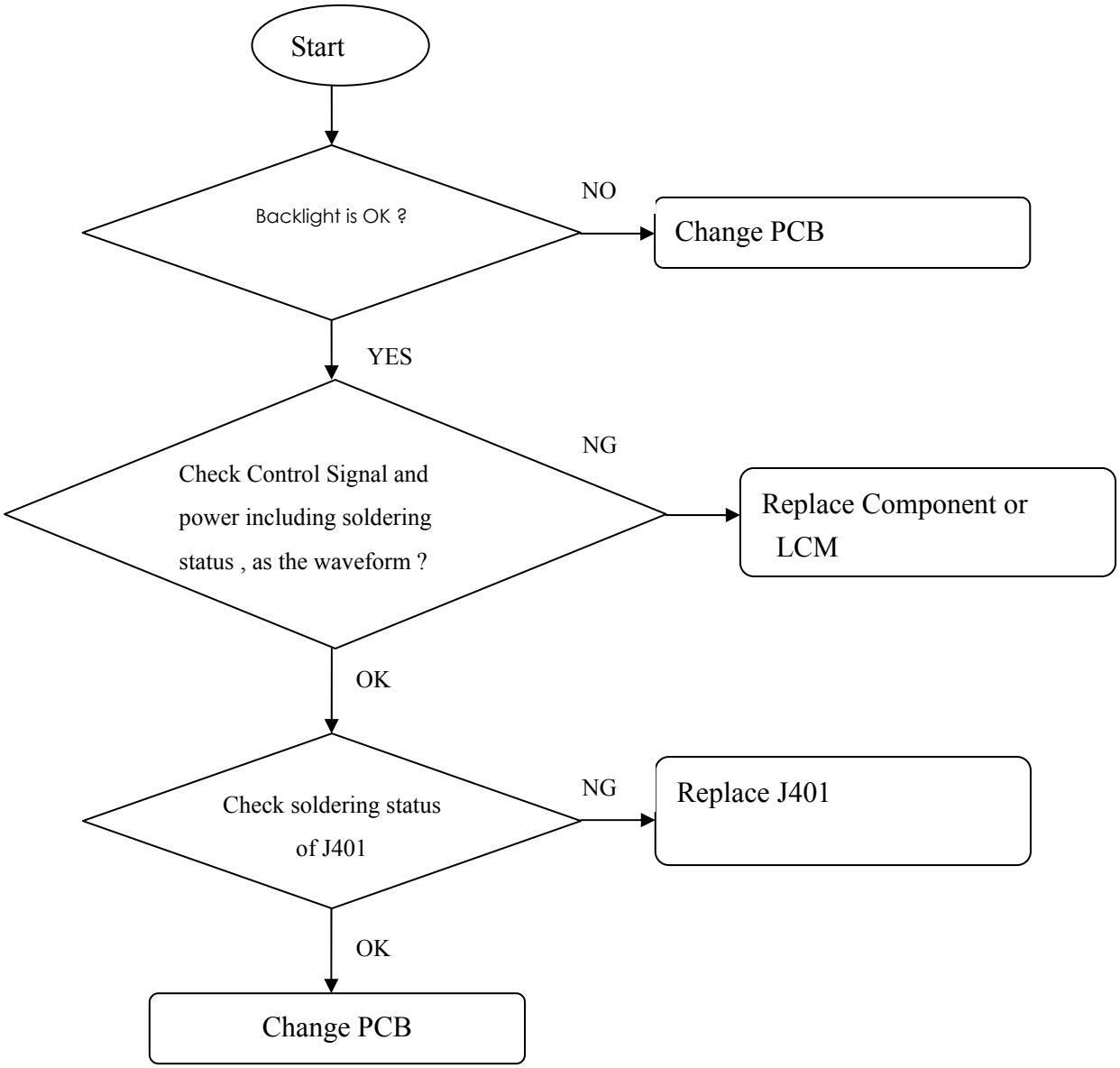
Test Point



Circuit Diagram

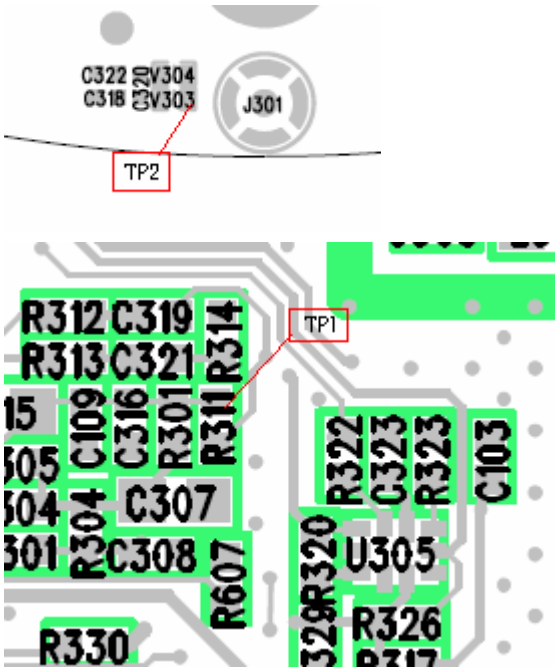


Checking Flow

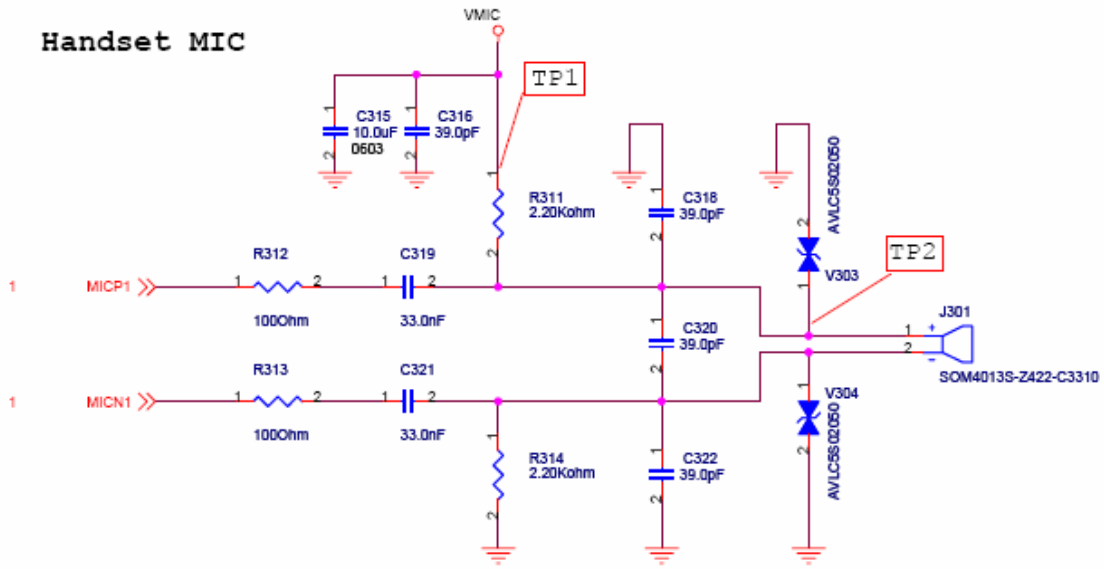

Start
Backlight is OK ?
NO
Change PCB
YES
Check Control Signal and power including soldering status , as the waveform ?
NG
Replace Component or LCM
OK
Check soldering status of J401
NG
Replace J401
OK
Change PCB

4.11 Microphone Trouble

Test Point



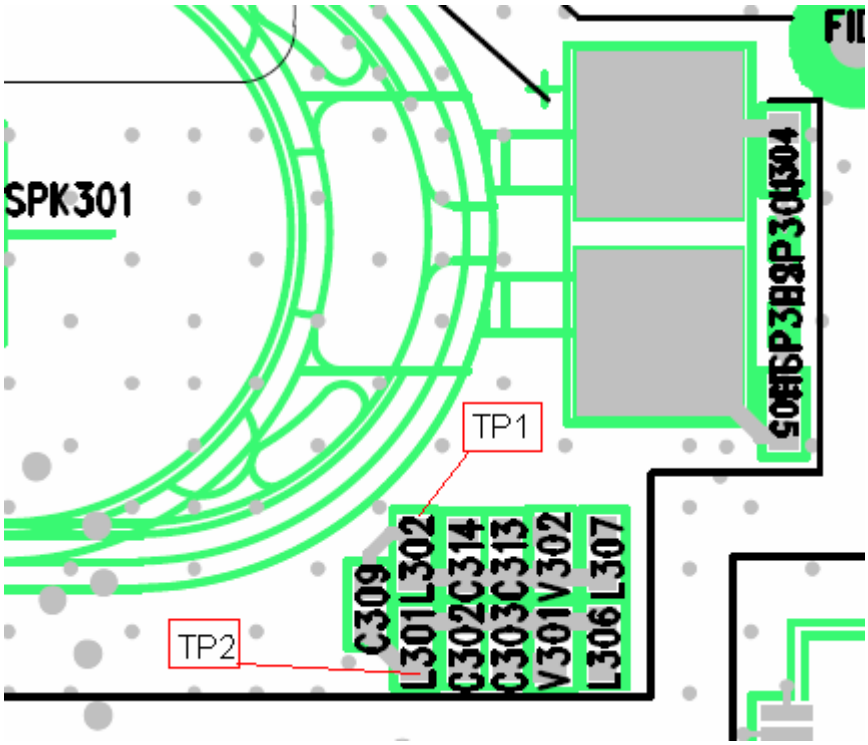
Circuit Diagram



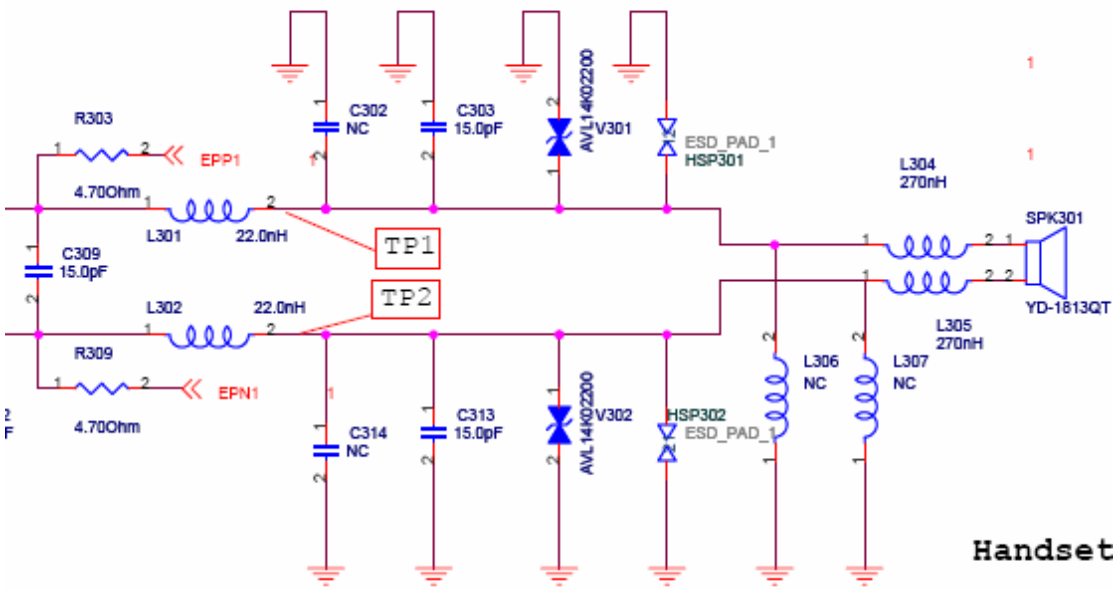
Checking Flow

4.12 Receiver Trouble

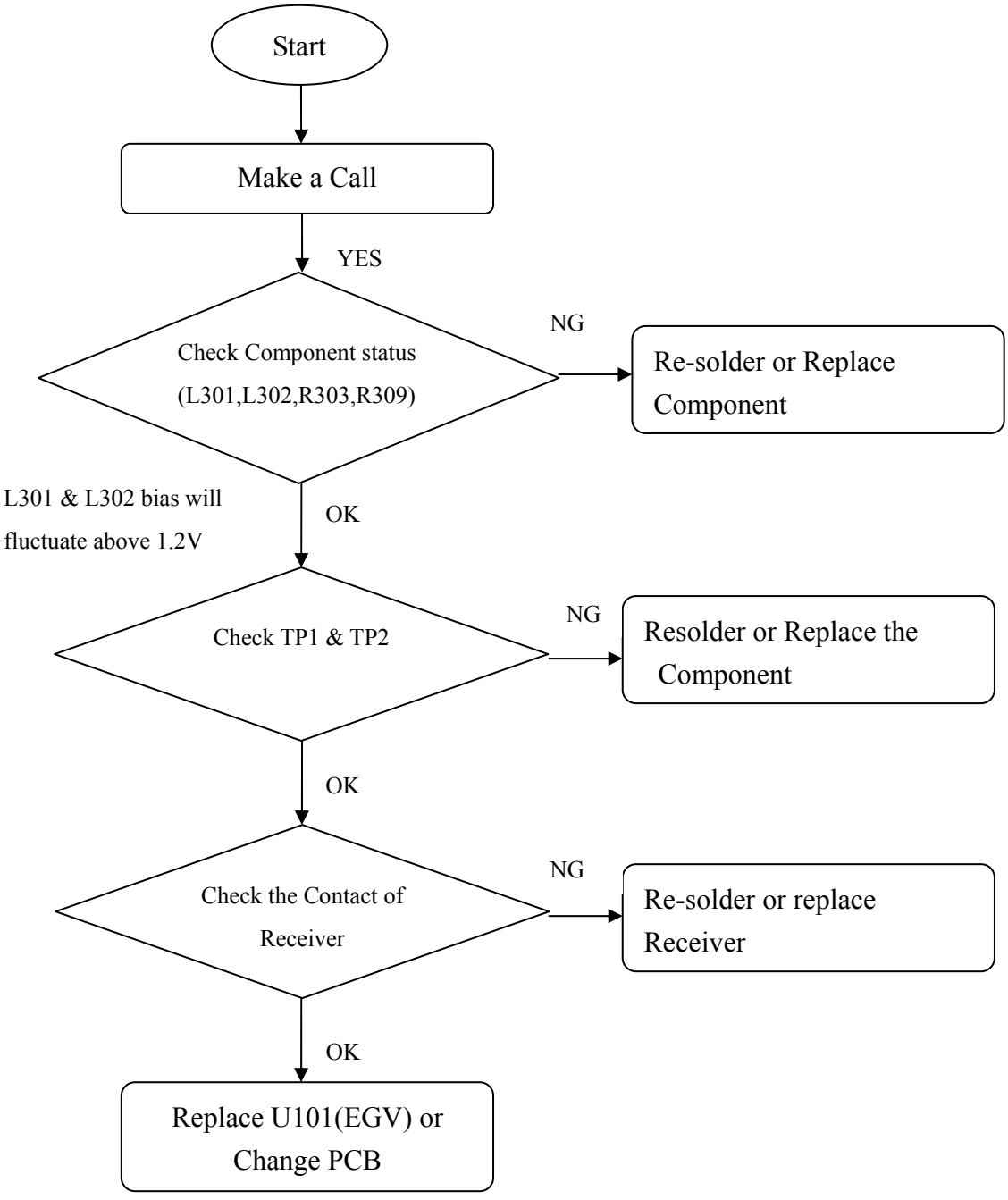
Test Point



Circuit Diagram

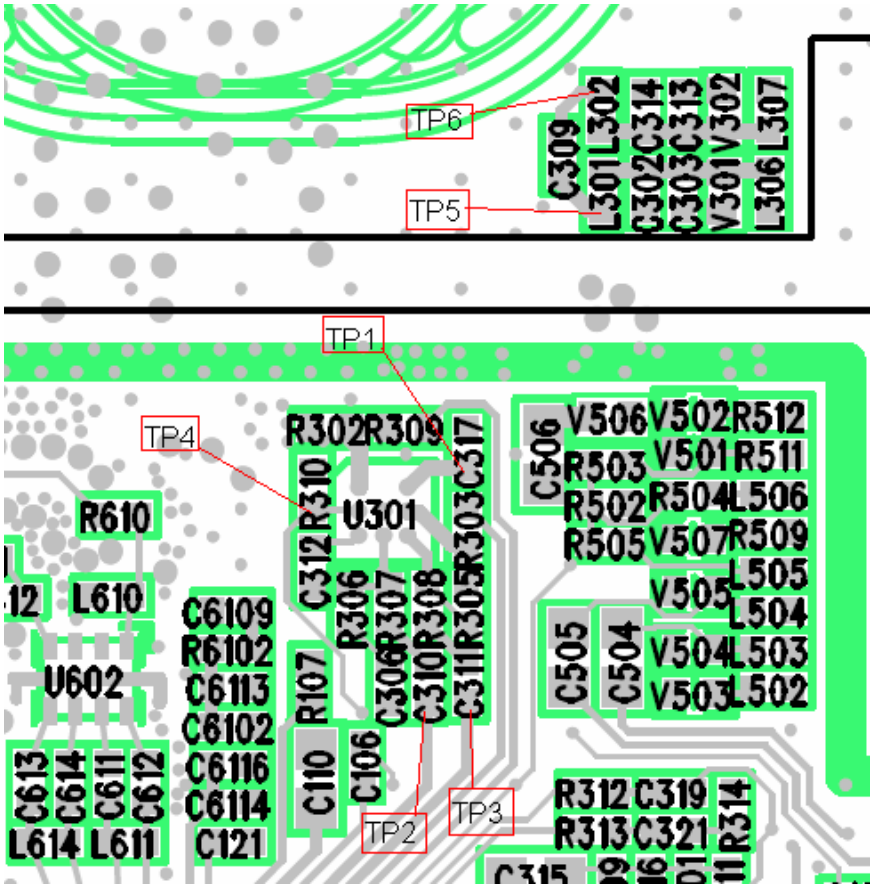


Checking Flow

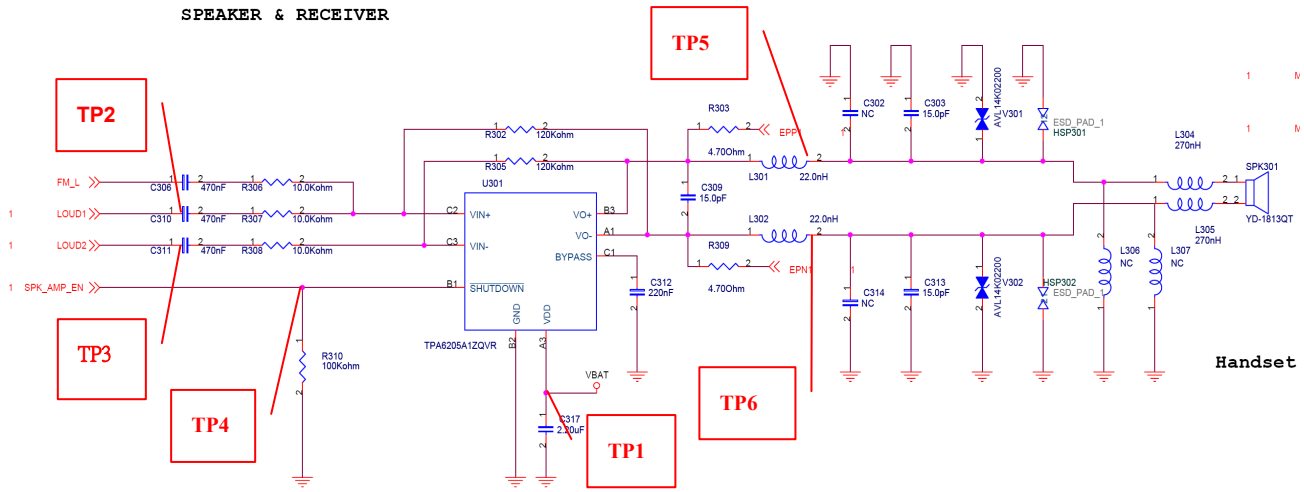

Start
Make a Call
YES
Check Component status
(L301,L302,R303,R309)
NG
Re-solder or Replace
Component
L301 & L302 bias will
fluctuate above 1.2V
OK
Check TP1 & TP2
NG
Resolder or Replace the
Component
OK
Check the Contact of
Receiver
NG
Re-solder or replace
Receiver
OK
Replace U101(EGV) or
Change PCB

4.13 Speaker Trouble

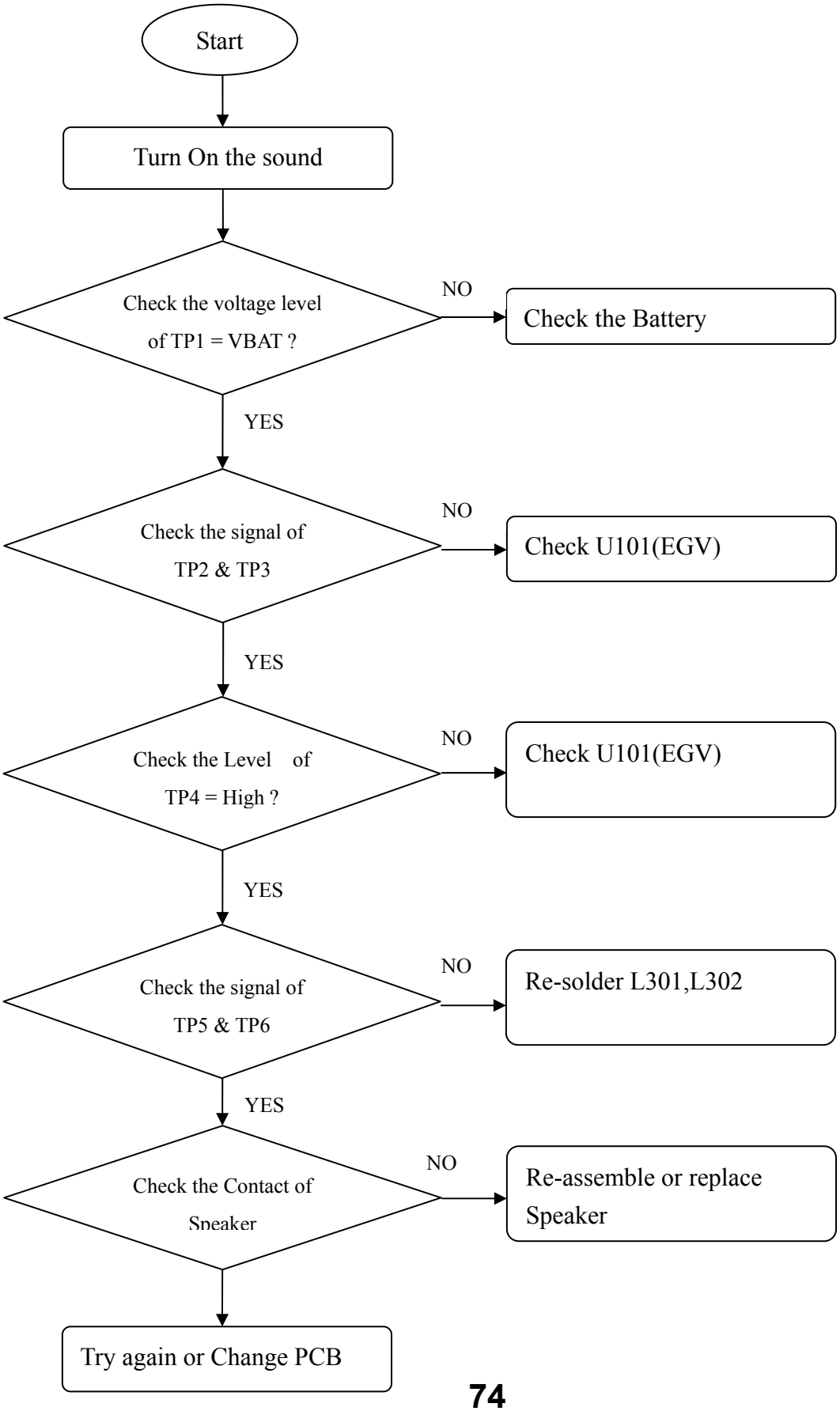
Test Point



Circuit Diagram

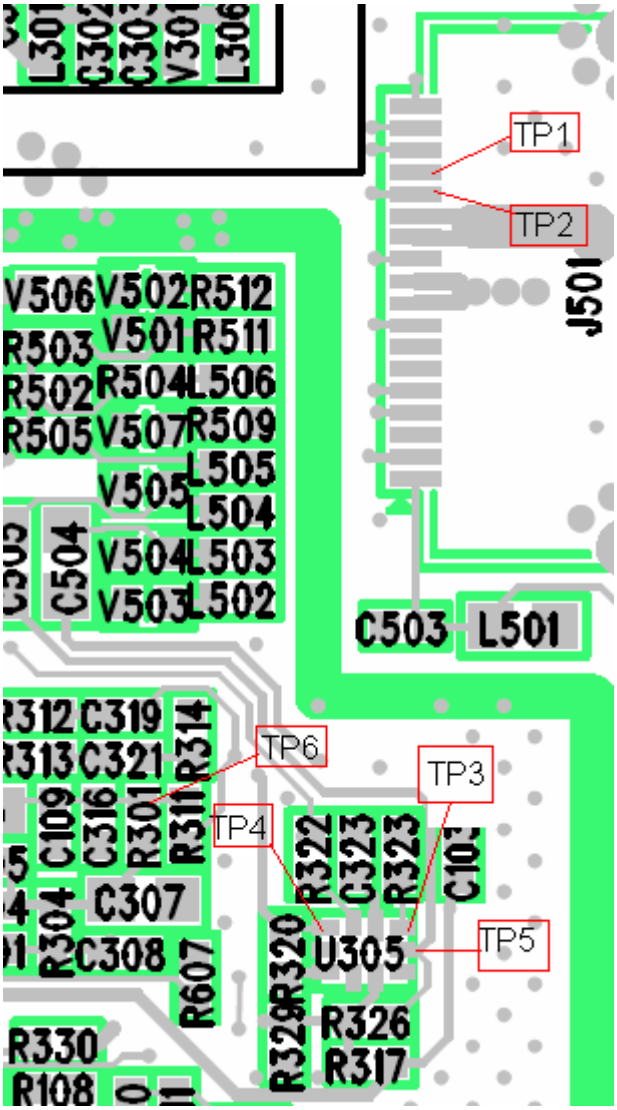


Checking Flow

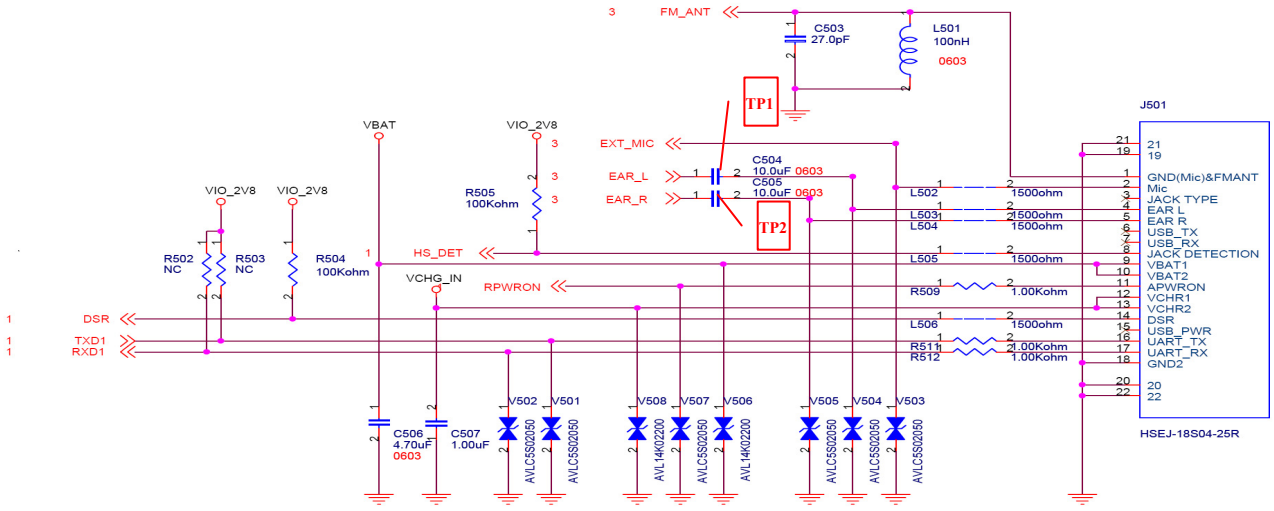


4.14 Headphone Trouble

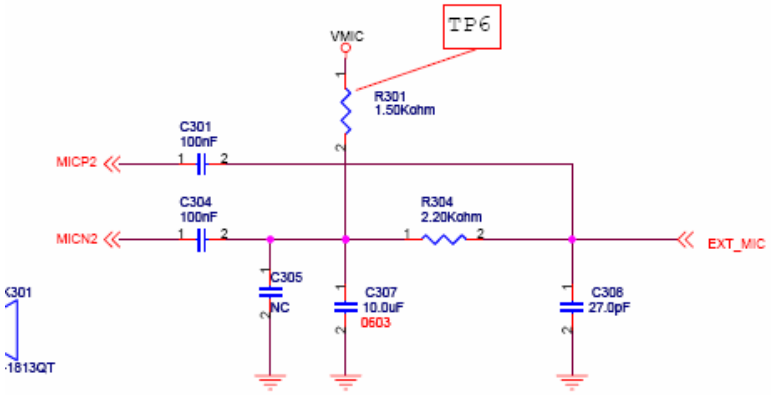
Test Point

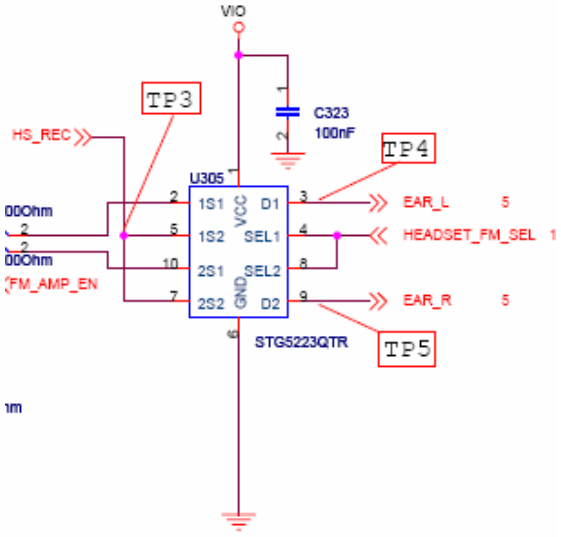


Circuit Diagram

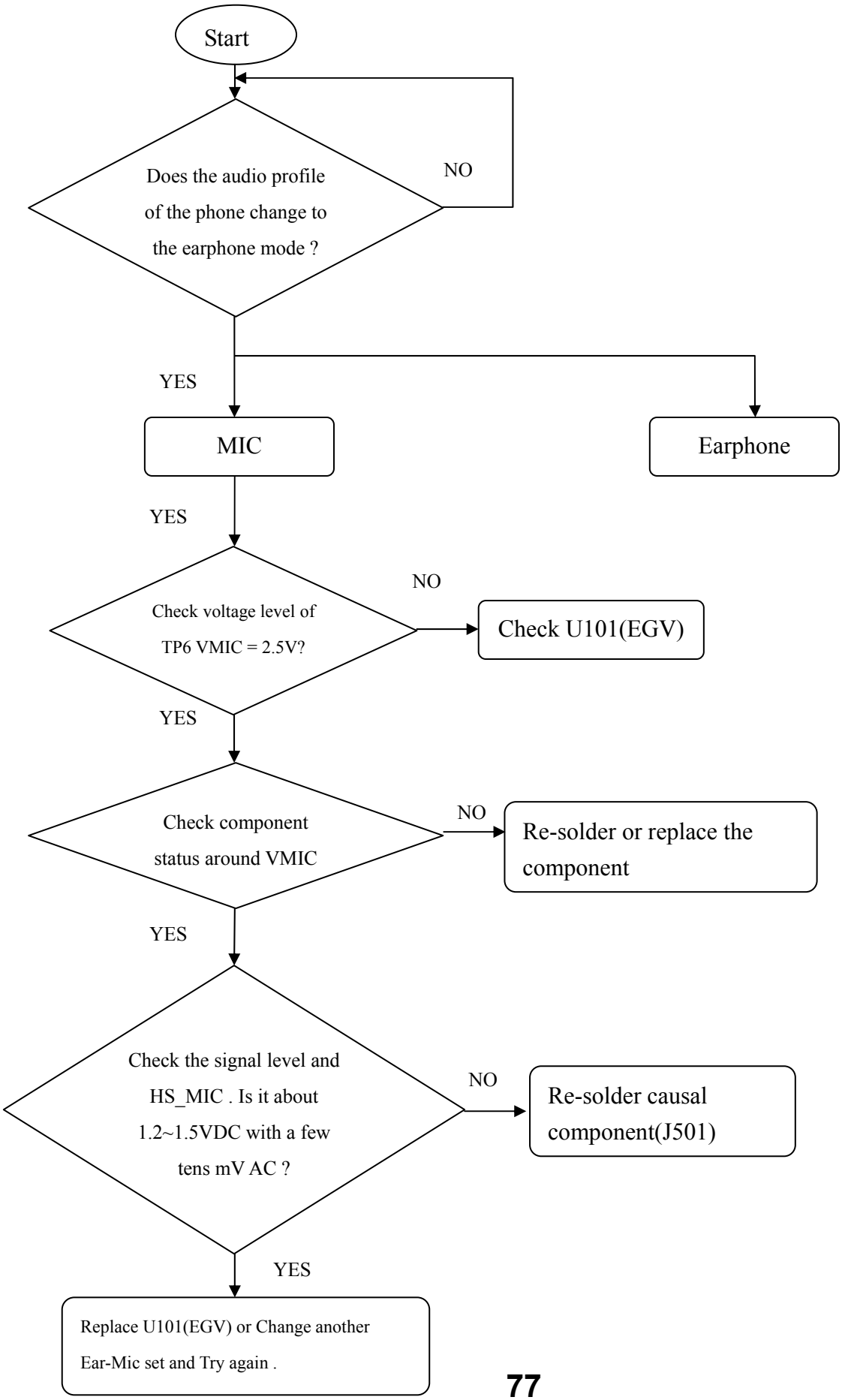


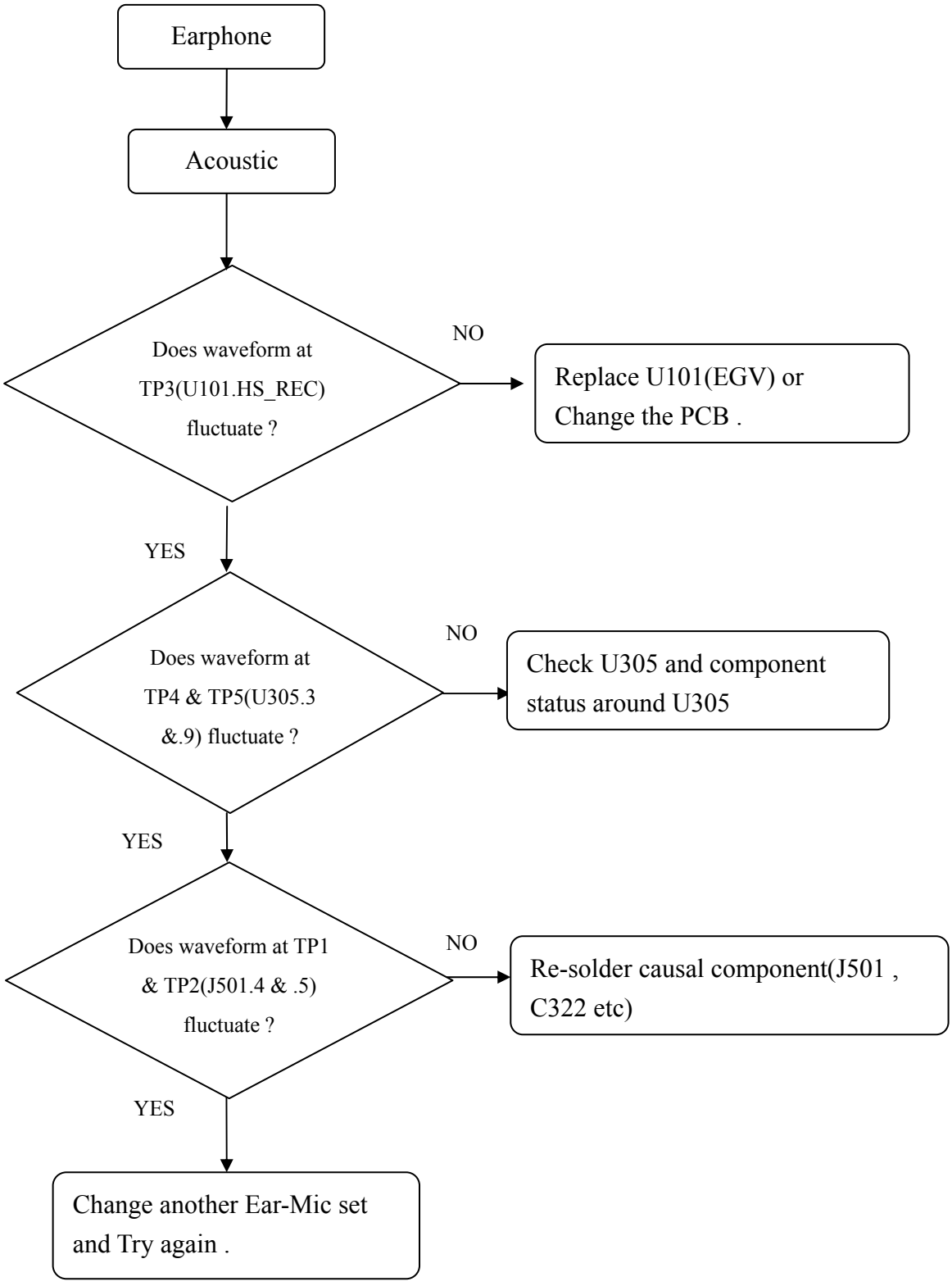
Headset MIC





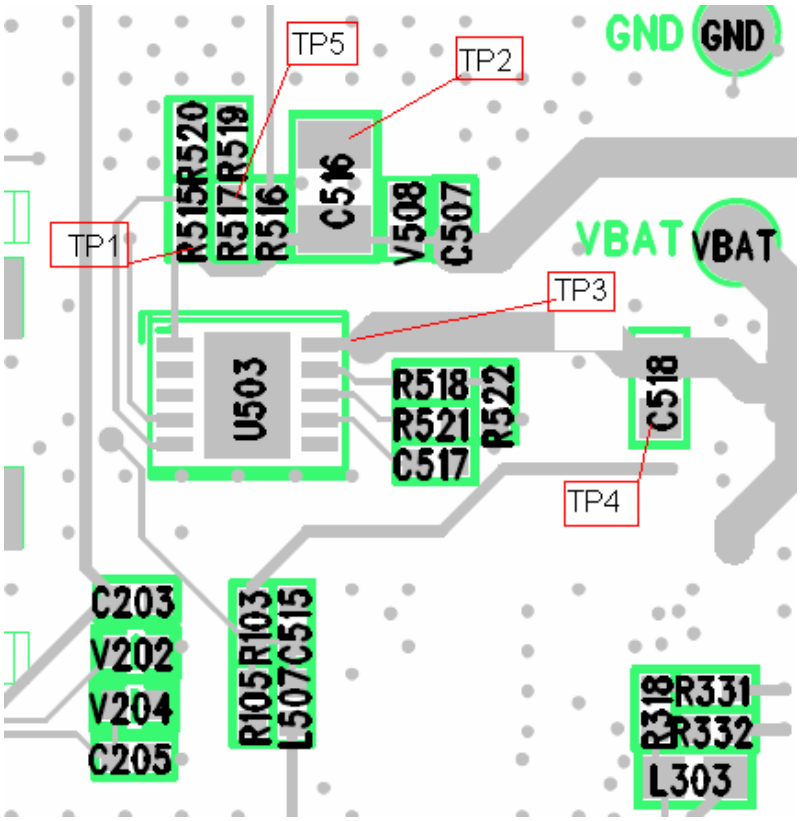
Checking Flow



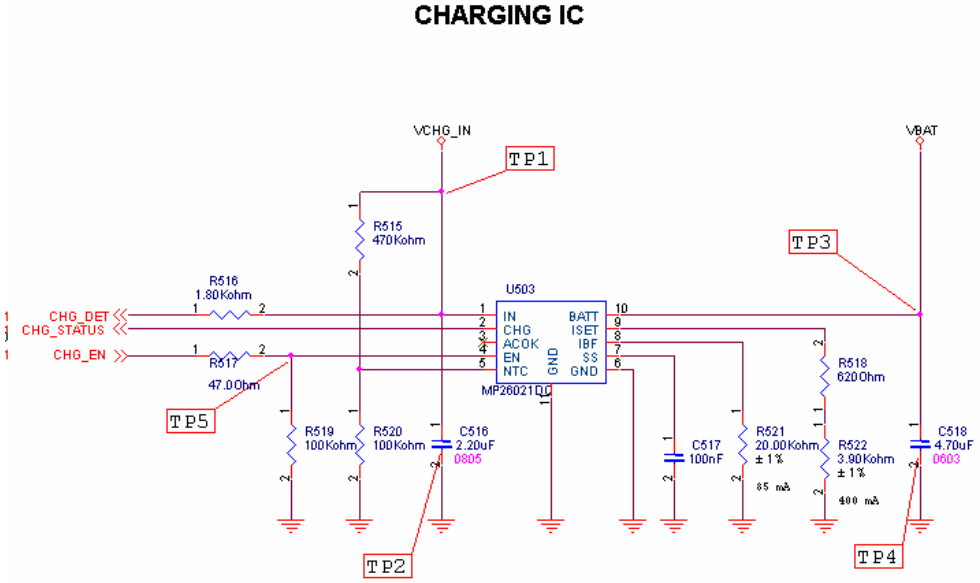

Earphone
Acoustic
Does waveform at TP3(U101.HS_REC) fluctuate ?
NO
Replace U101(EGV) or Change the PCB .
YES
Does waveform at TP4 & TP5(U305.3 &.9) fluctuate ?
NO
Check U305 and component status around U305
YES
Does waveform at TP1 & TP2(J501.4 & .5) fluctuate ?
NO
Re-solder causal component(J501 , C322 etc)
YES
Change another Ear-Mic set and Try again .

4.15 Charging Trouble

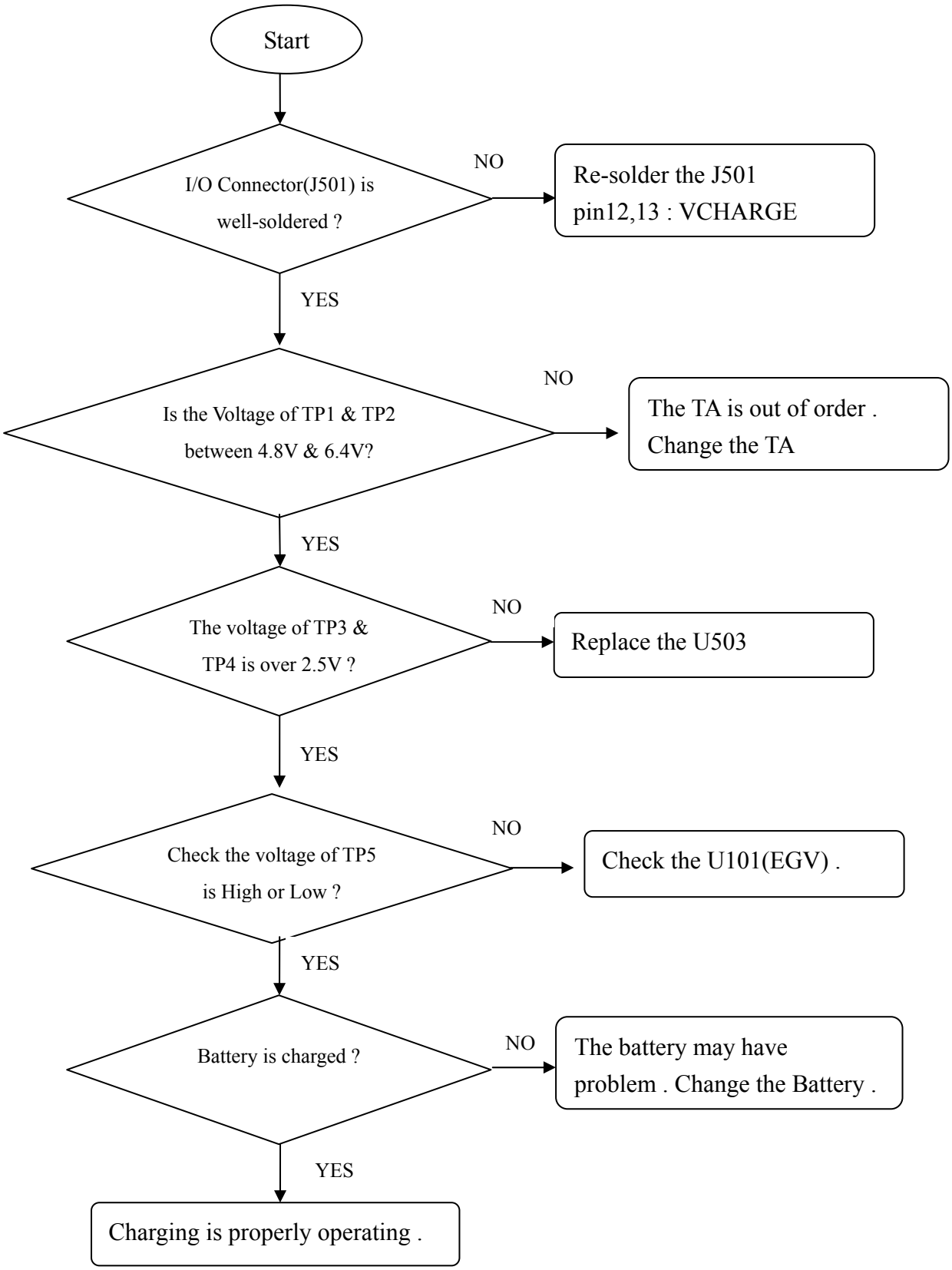
Test Point



Circuit Diagram



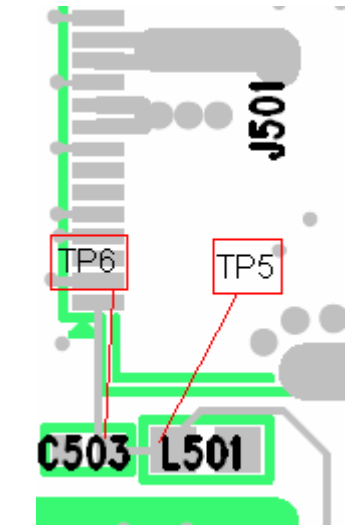
Checking Flow

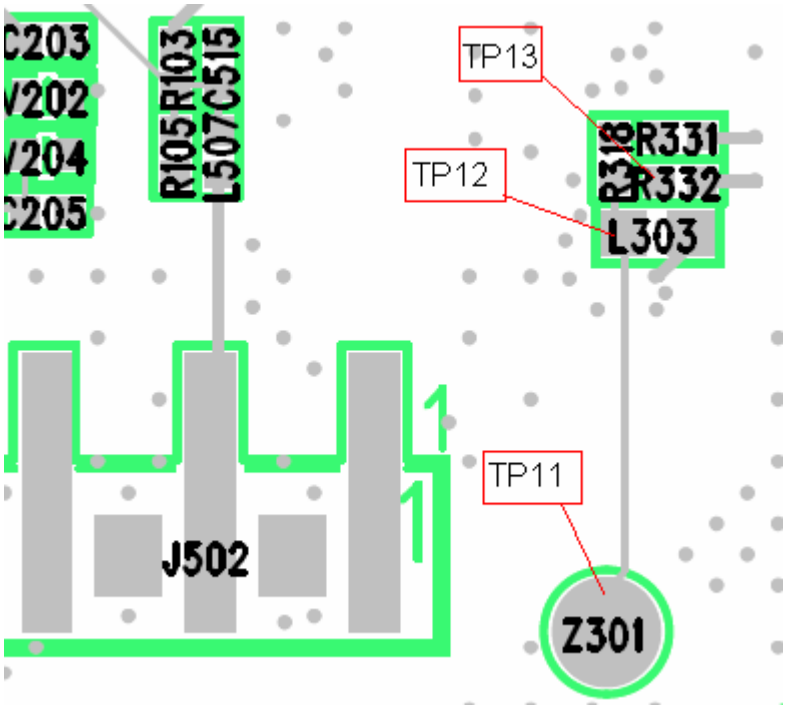


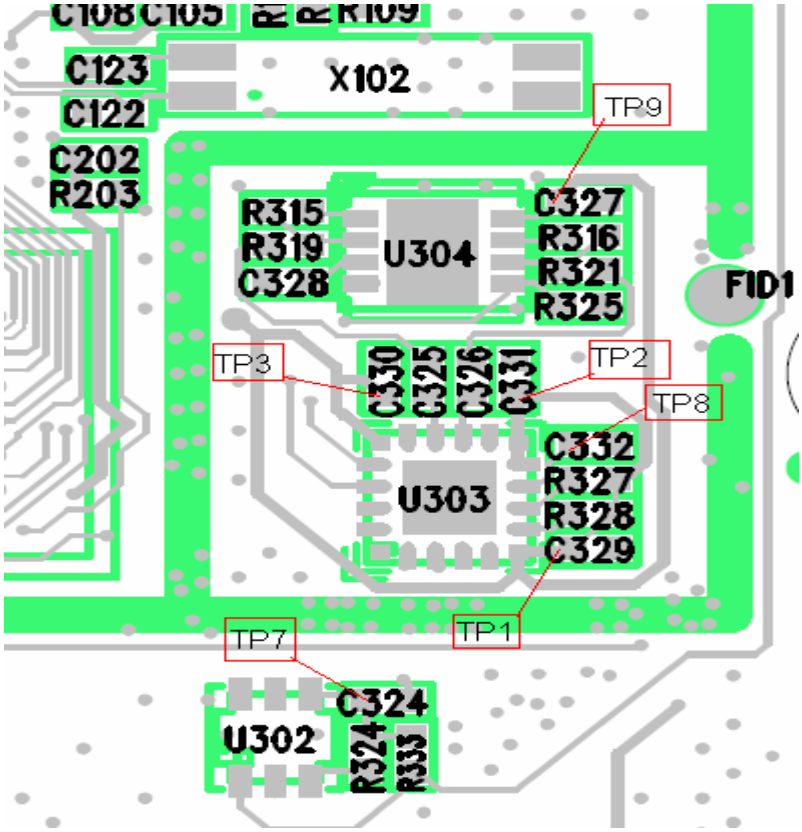
4.16 FM Radio Trouble (GB105 / GB105b / GB106 only)

*** FM intenna (internal antenna) : GB106 only**

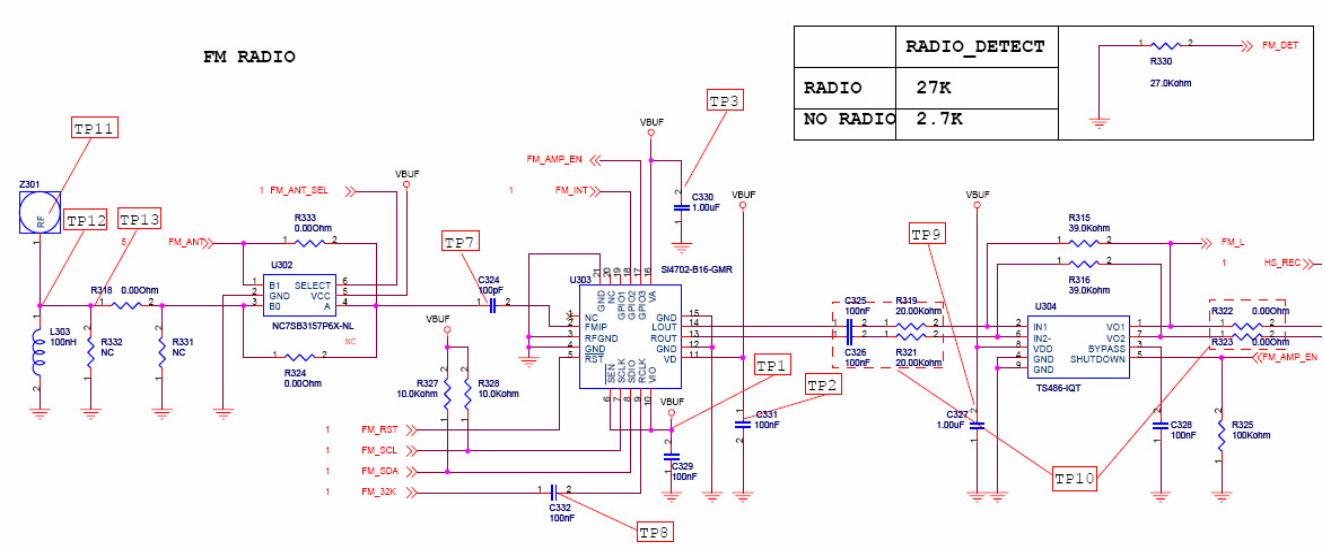
Test Point

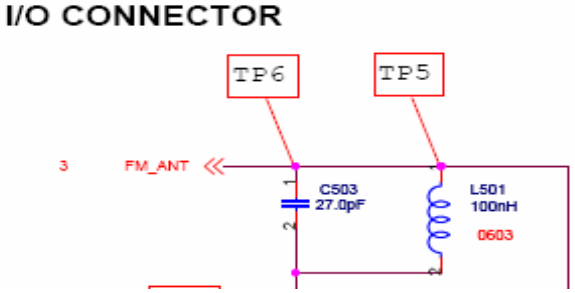




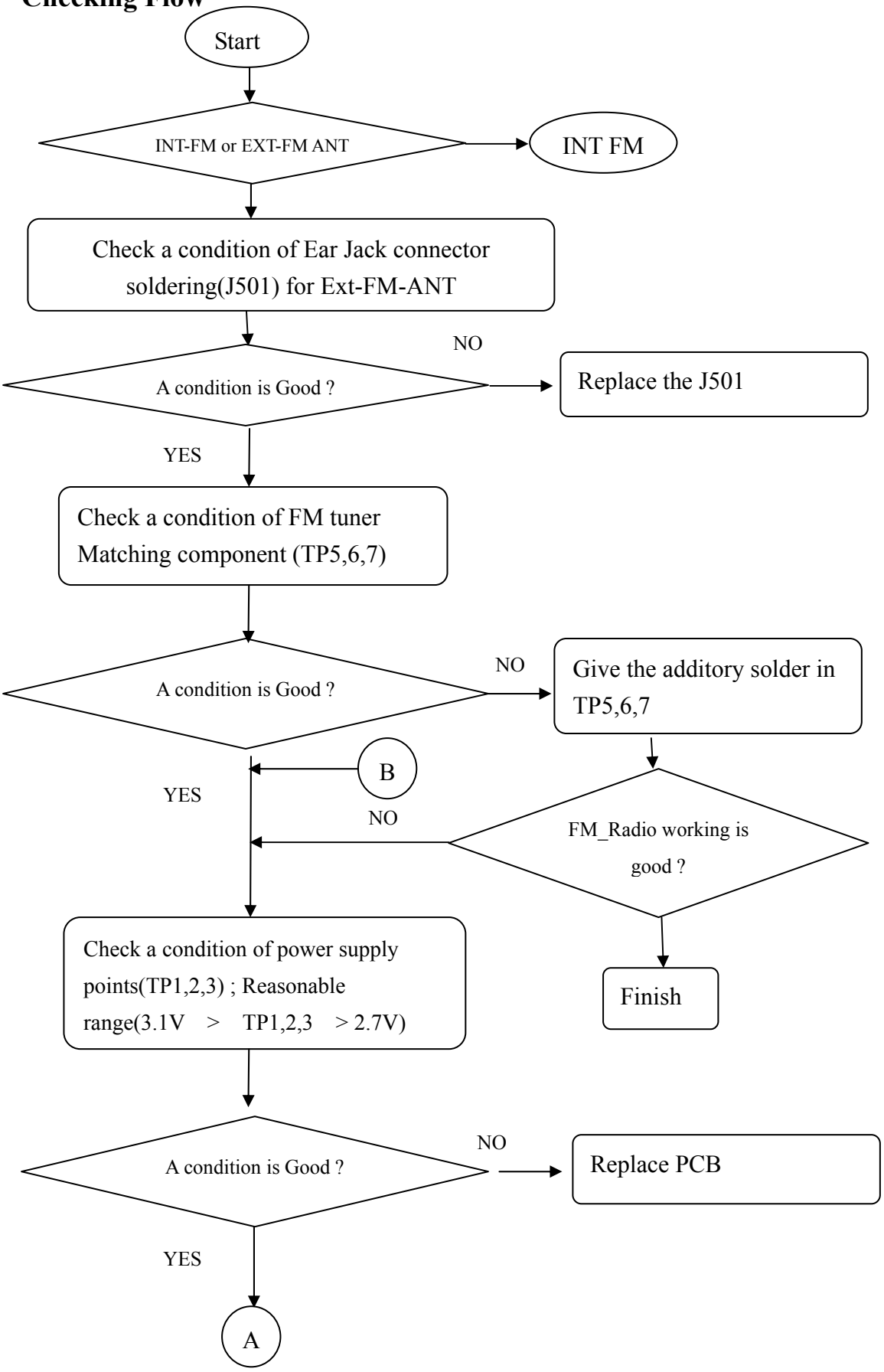


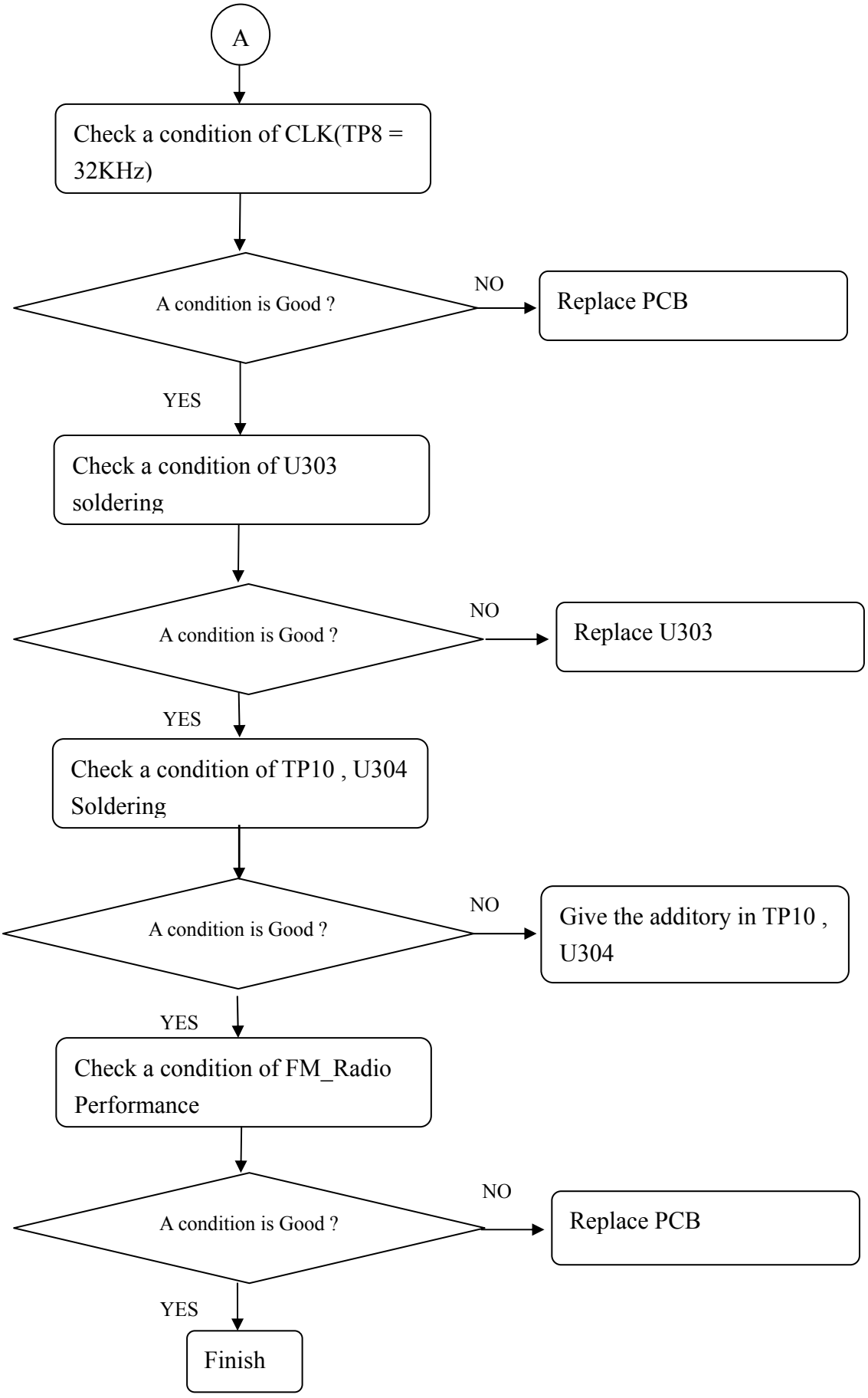
Circuit Diagram



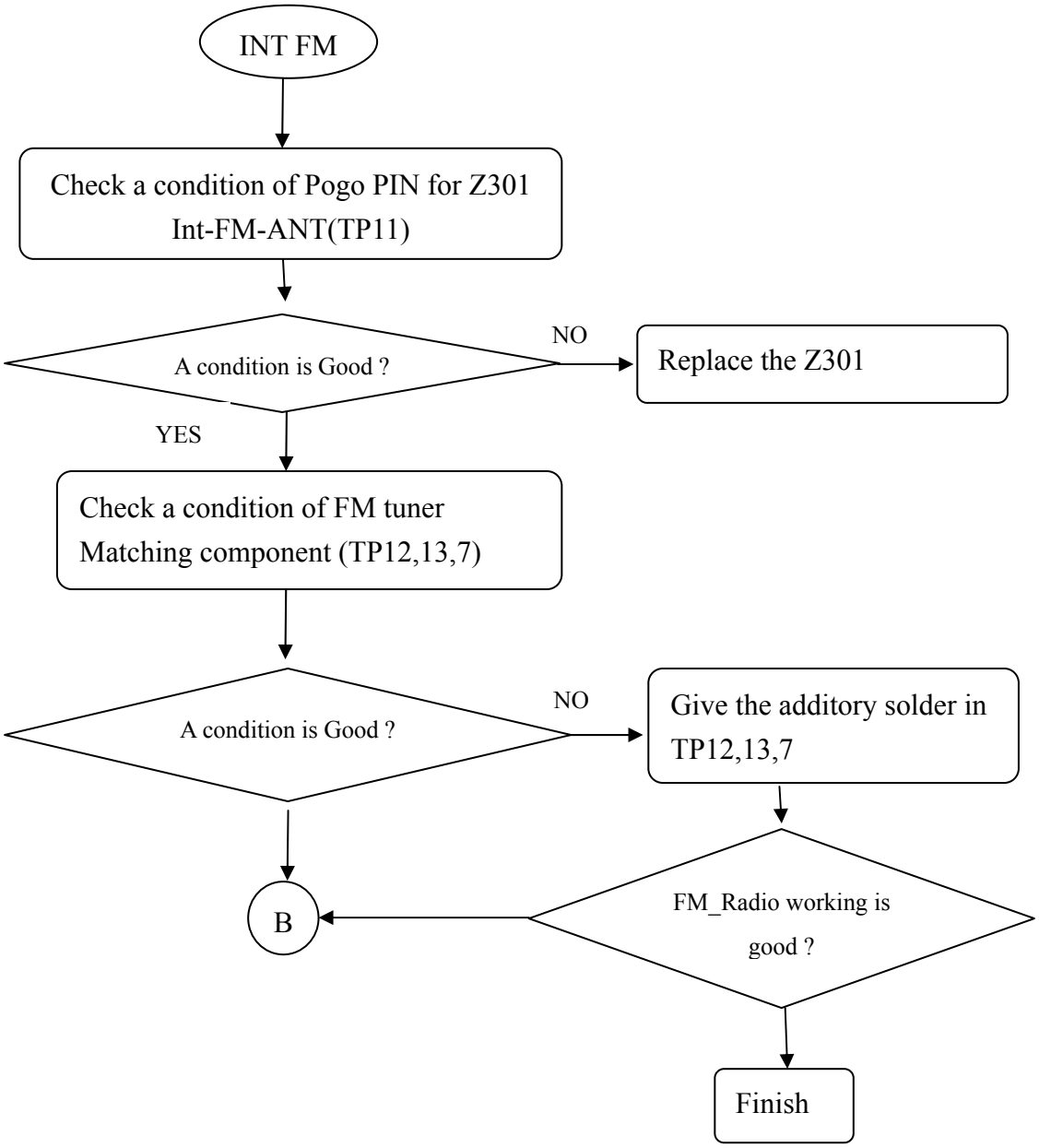


Checking Flow



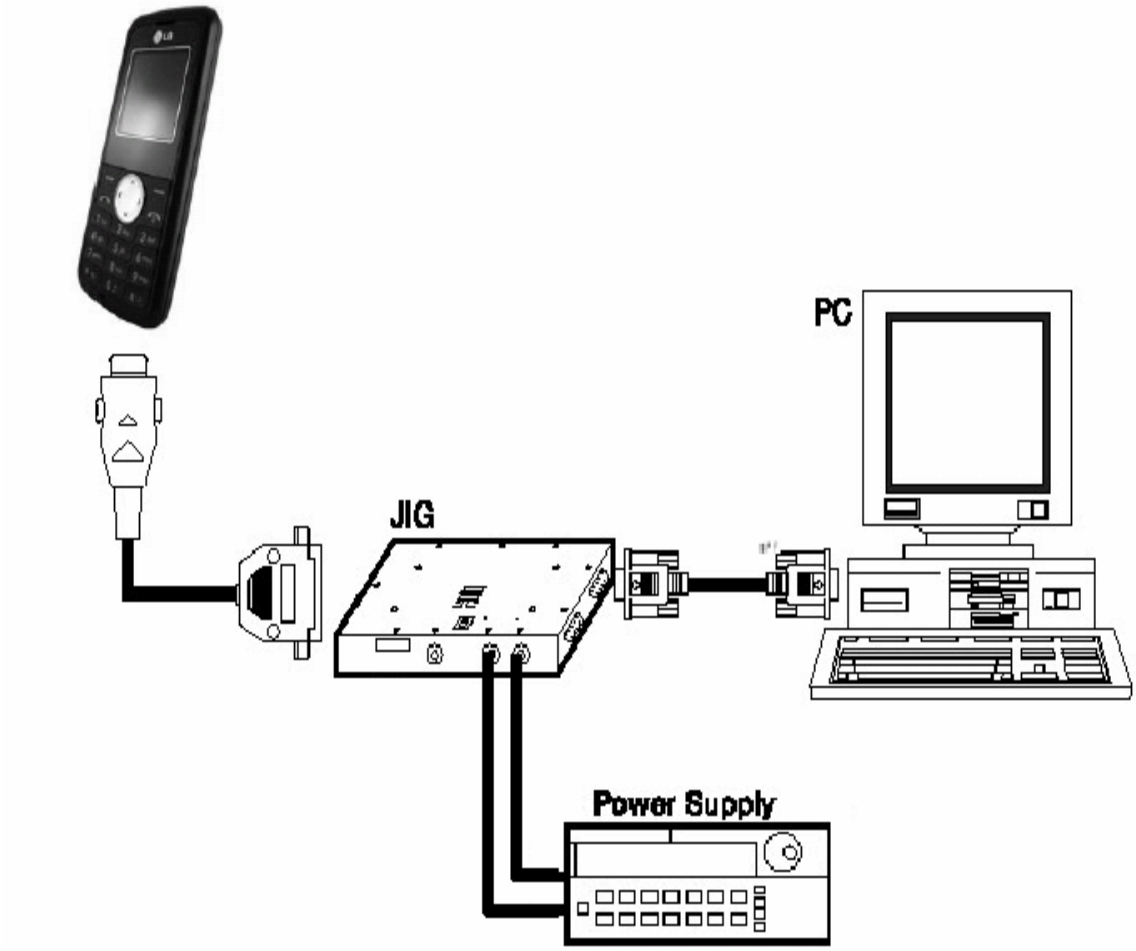

A
Check a condition of CLK(TP8 = 32KHz)
A condition is Good ?
NO
Replace PCB
YES
Check a condition of U303 soldering
A condition is Good ?
NO
Replace U303
YES
Check a condition of TP10 , U304 Soldering
A condition is Good ?
NO
Give the additory in TP10 , U304
YES
Check a condition of FM_Radio Performance
A condition is Good ?
NO
Replace PCB
YES
Finish

FM intenna trouble (GB106 only)



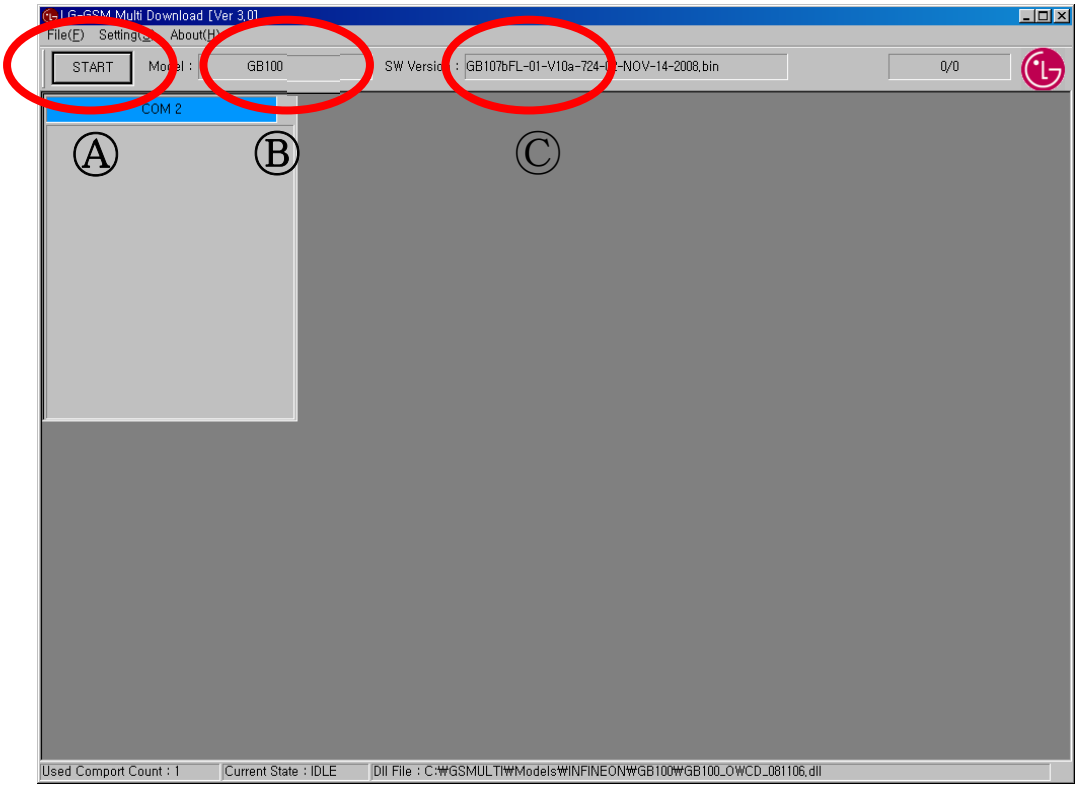
5. DOWNLOAD

5.1 Download Setup



5.2 Download Process

Download step[1]



Ⓐ: Start or Stop download

Ⓑ: Selected configuration DLL file

Ⓒ: File name donwloading

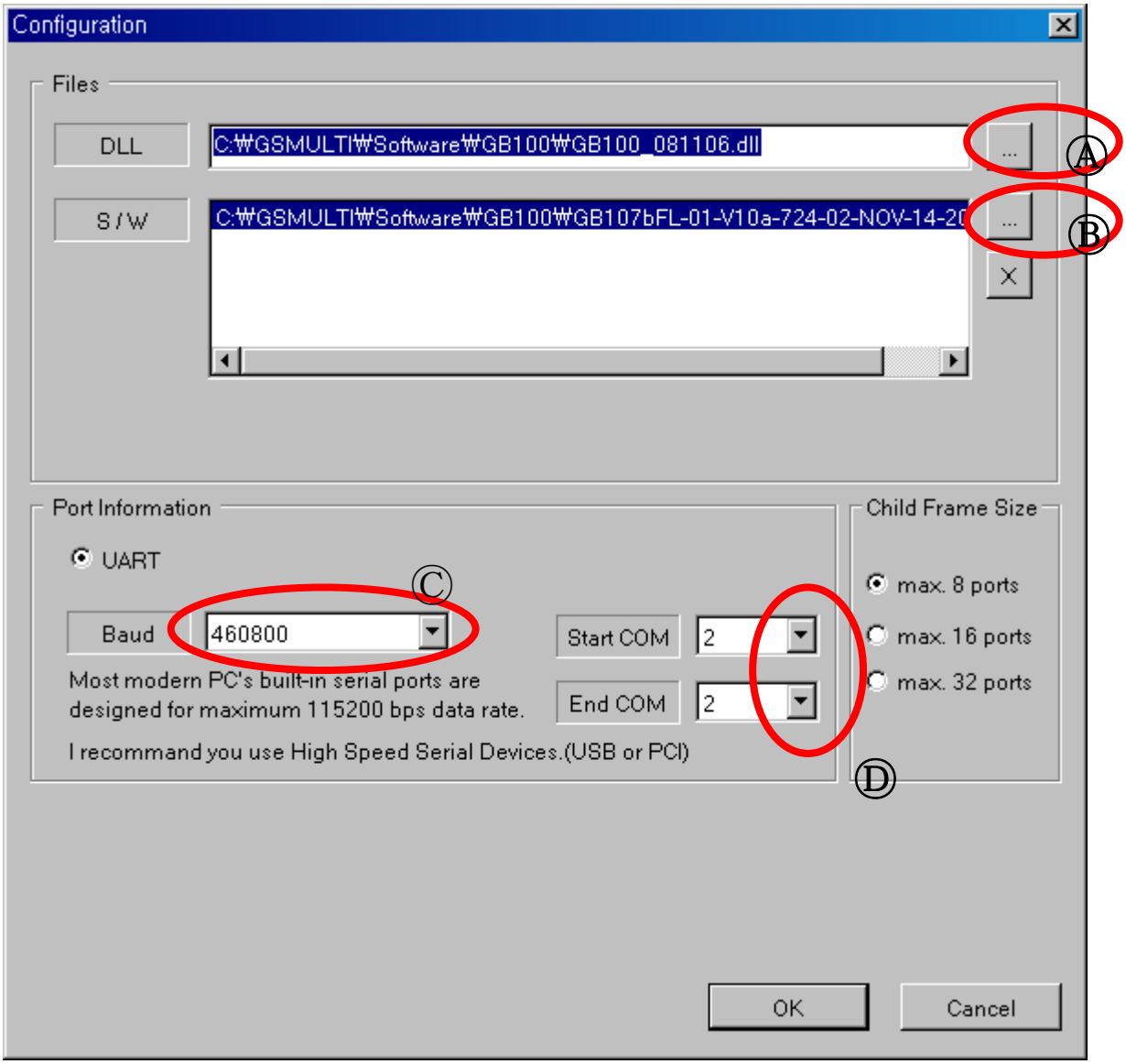
File(F) → Exit(X) : End program

Setting(S) → Configuration : configuration download condition DLL, SW files and etc.

About(H) → MultiGSM : Provide version information

First, select Setting Menu.

Download step[2]



Ⓐ: Select a appropriated DLL file

- You must select KP100_xxxxxx.DLL file.

ⒷSelect files downloaded

-GB100- *.bin.

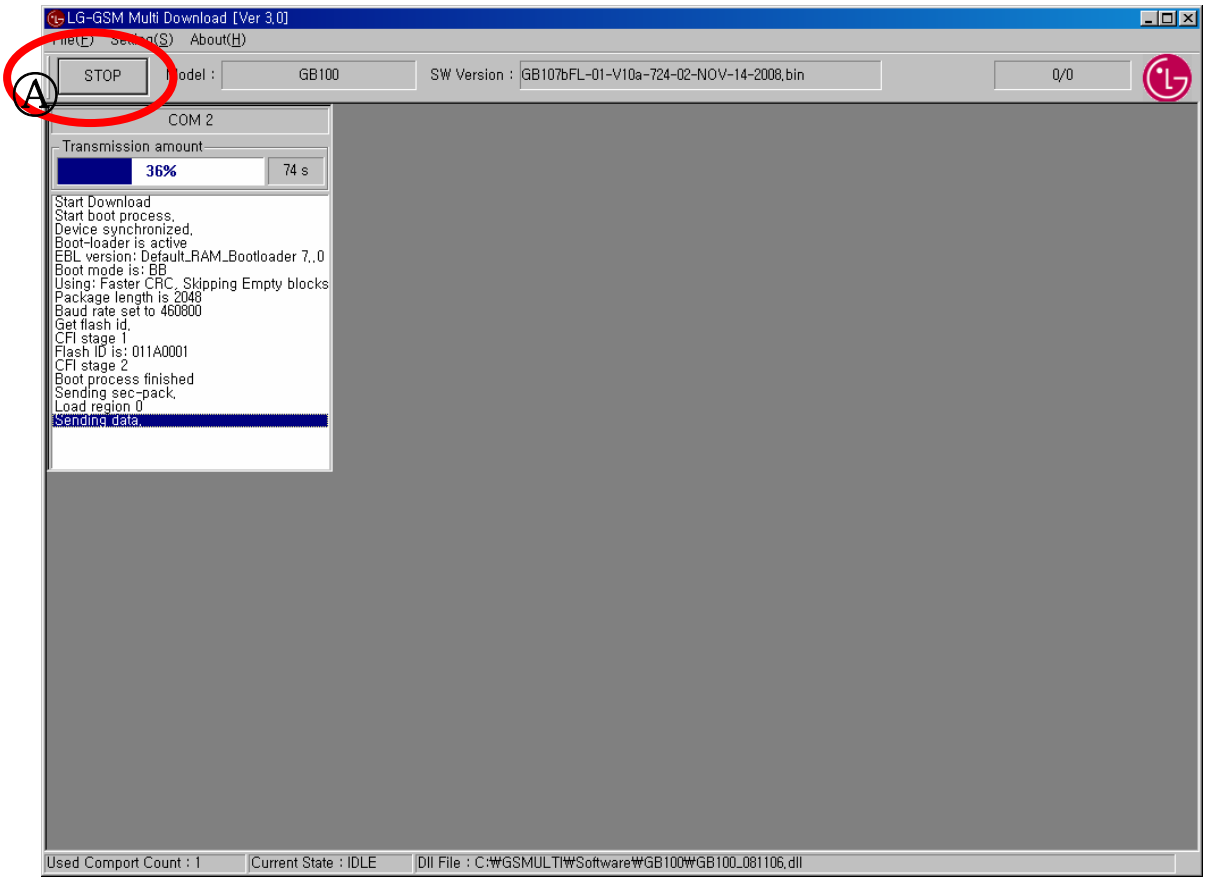
Ⓒ: Select download speed

-You must 460800. System supports maximum 460800bps.

Ⓓ: Select port

-select start and end port be operated

Download step[3]



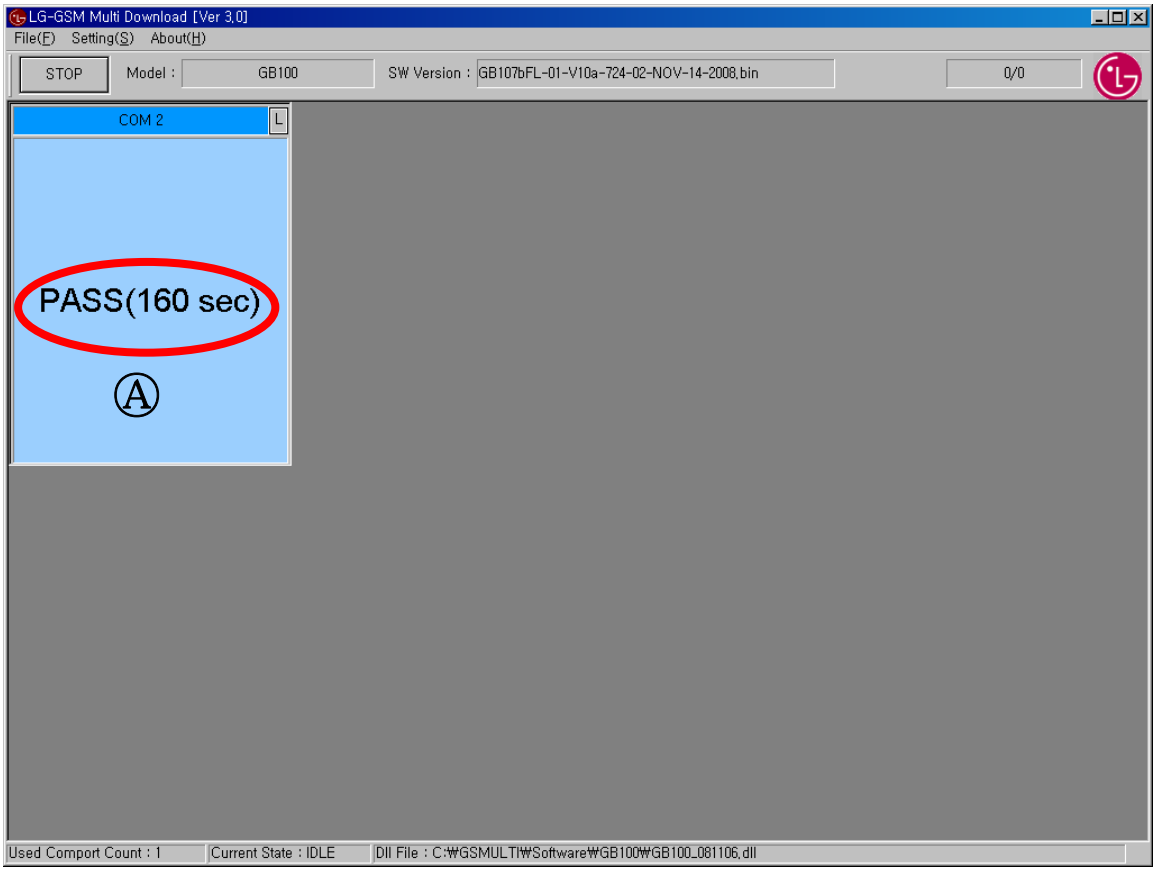
Ⓐ : Start download and stop download next step.

If configuration is finished, then push start button and then button is changed to STOP.

Turn on power of multi download and connector phones.

If download is started, then push start button else program will download repeatedly.

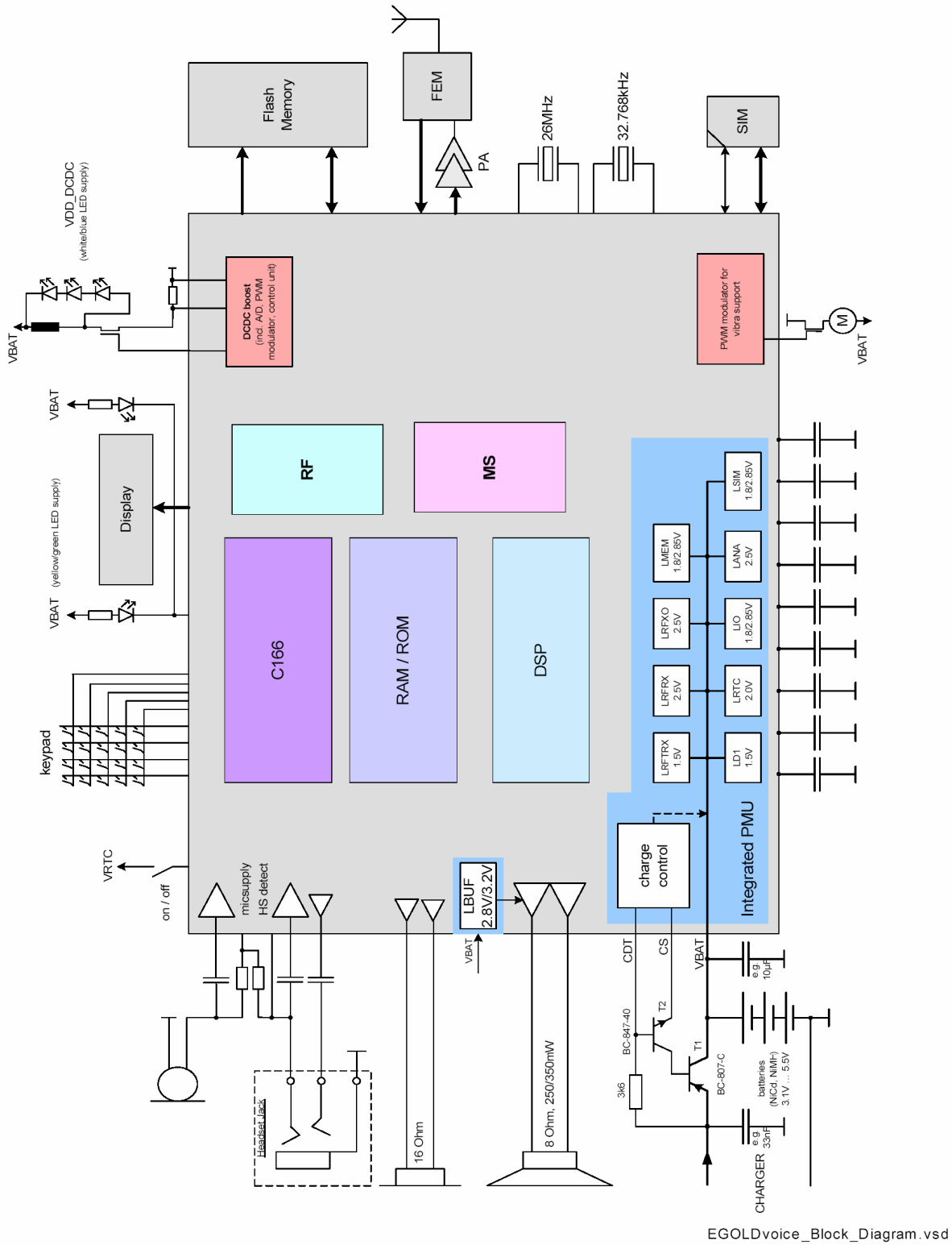
Download step[4]



Ⓐ : This region appears donwload status.

If download is finished, PASS or FAIL.message is showed.

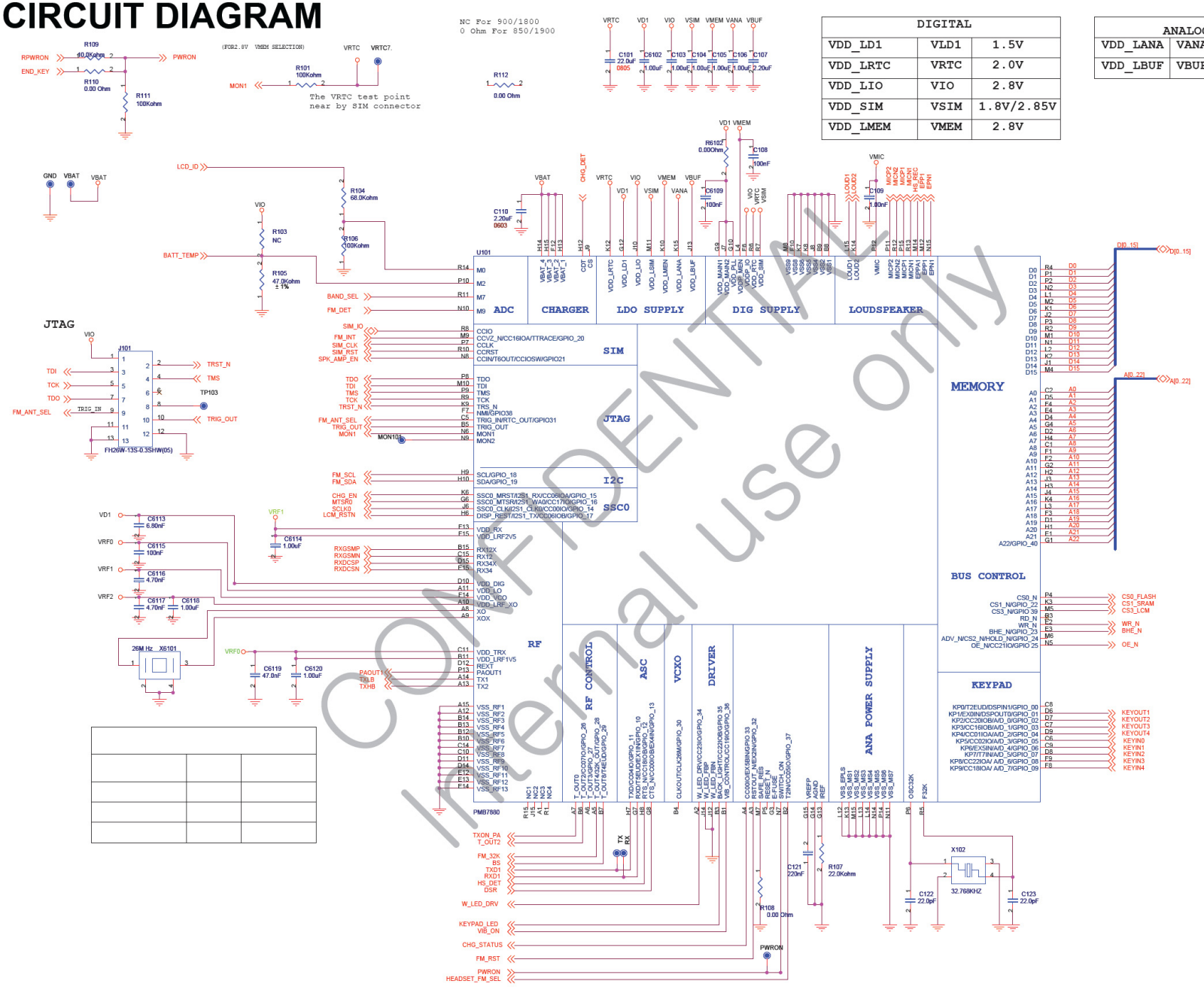
6. BLOCK DIAGRAM

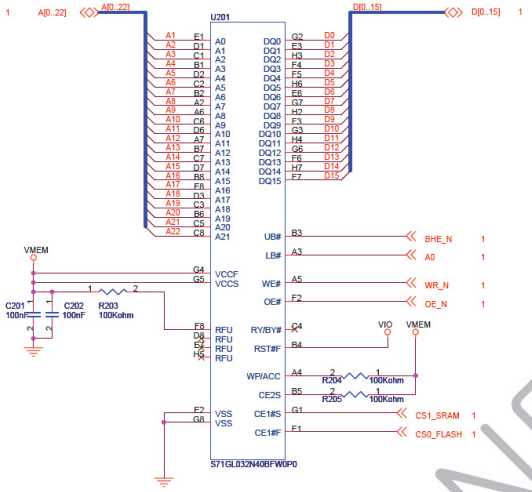


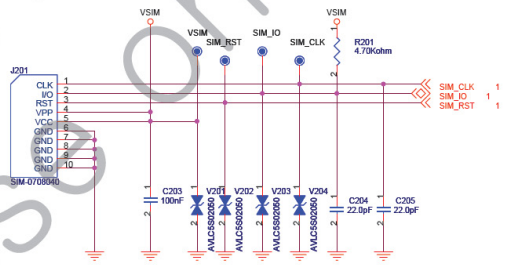
7. CIRCUIT DIAGRAM

DIGITAL		
VDD_LD1	VLD1	1.5V
VDD_LRTC	VRTC	2.0V
VDD_LIO	VIO	2.8V
VDD_SIM	VSIM	1.8V/2.85V
VDD_LMEM	VMEM	2.8V

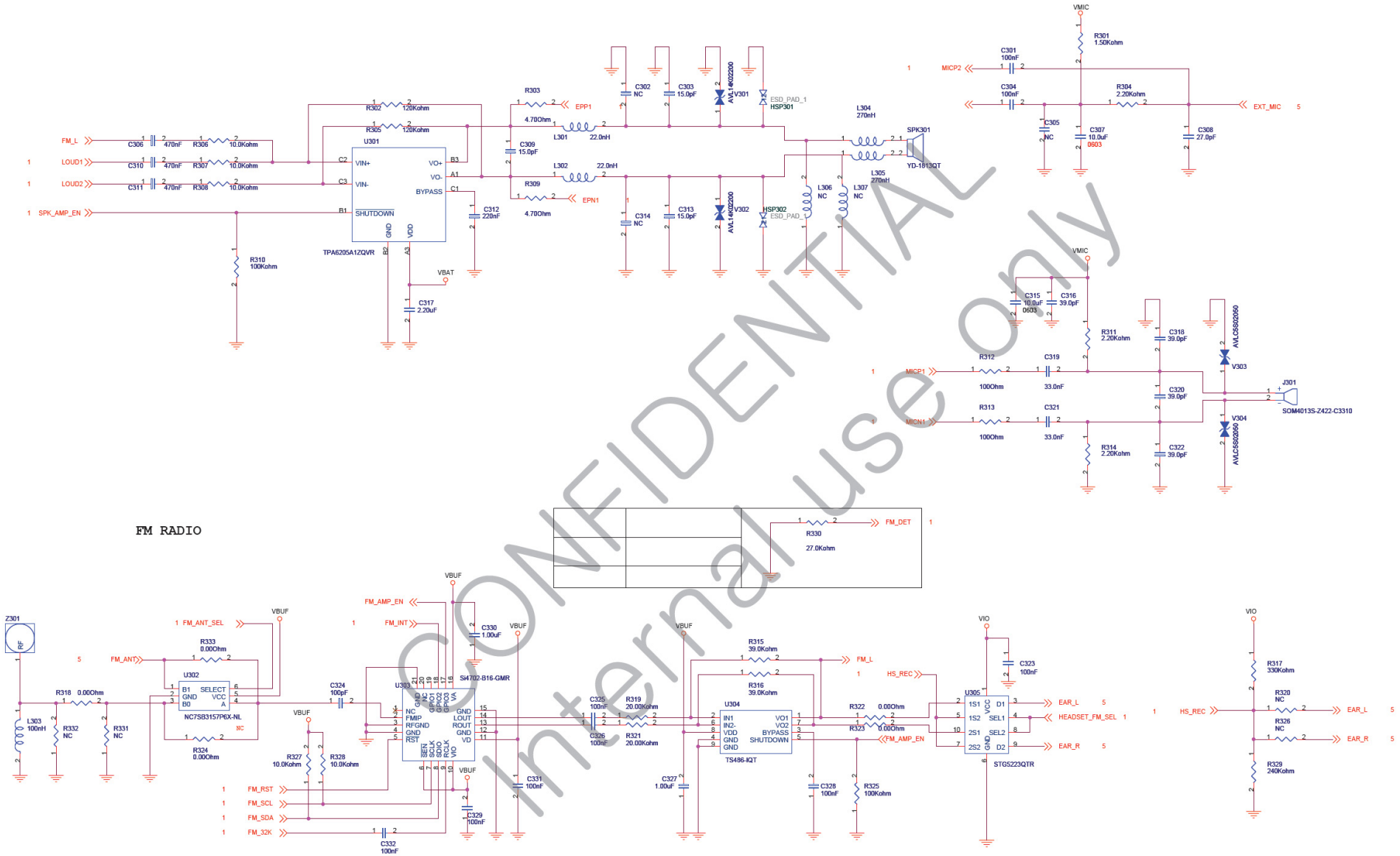
ANALOG		
VDD_LANA	VANA	2.5V
VDD_LBUF	VBUF	2.8V



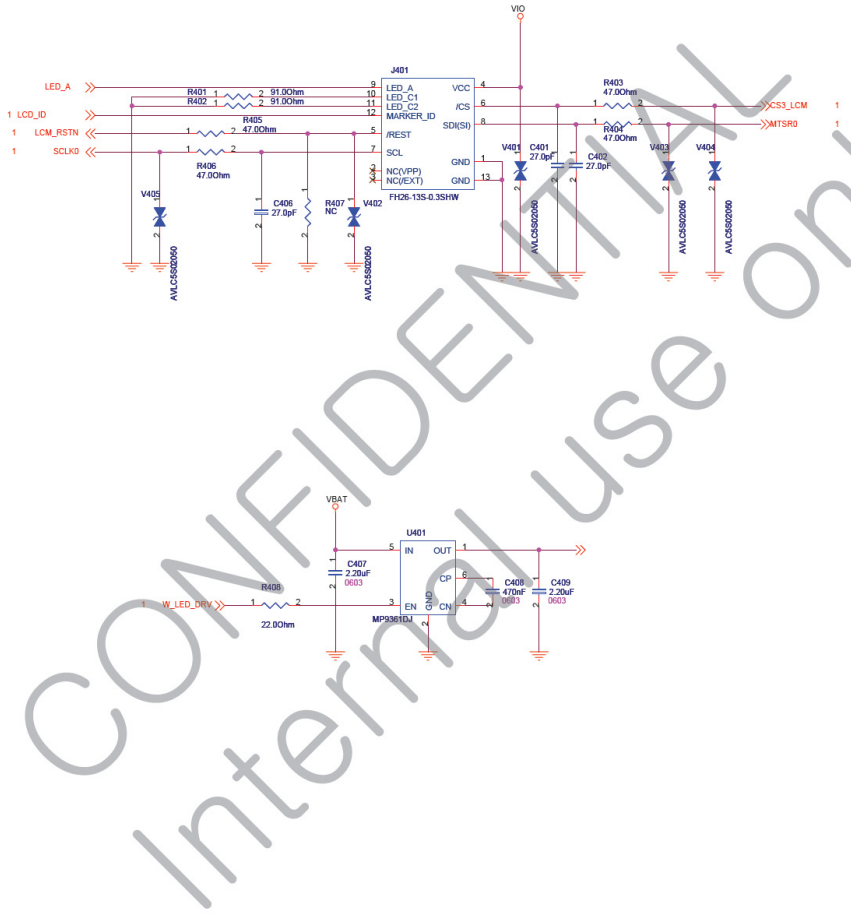




CONFIDENTIAL
Internal use only

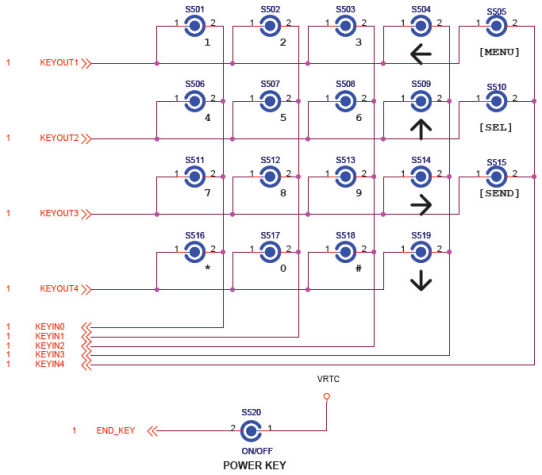


CONFIDENTIAL
Internal use only

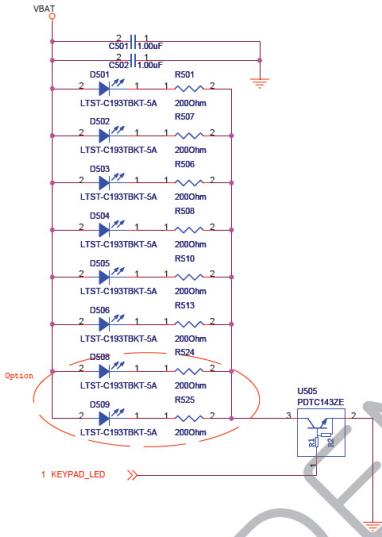


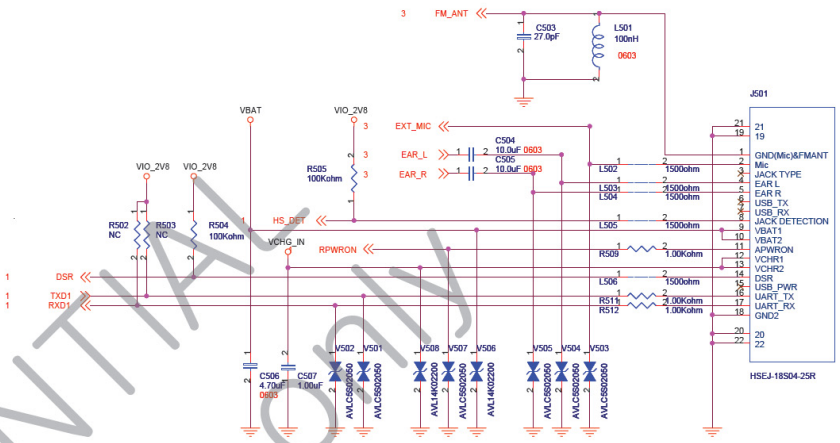
CONFIDENTIAL
Internal use only

KEY PAD

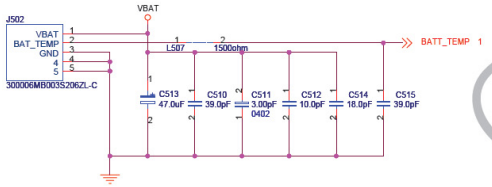


KEY BACKLIGHT

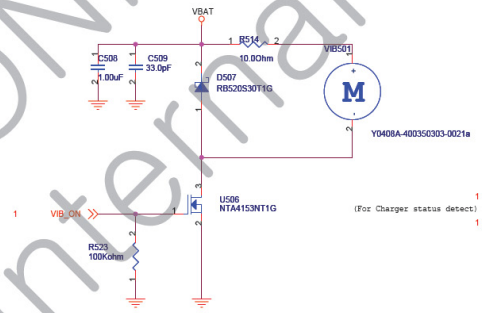




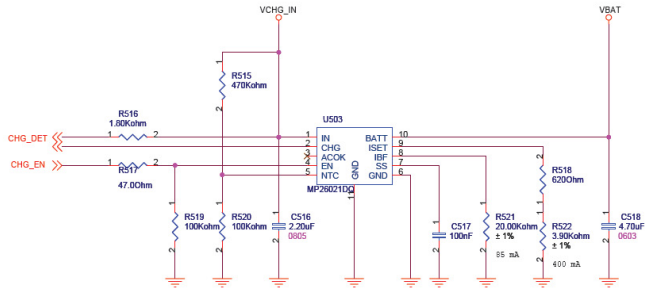
BATTERY CONNECTOR



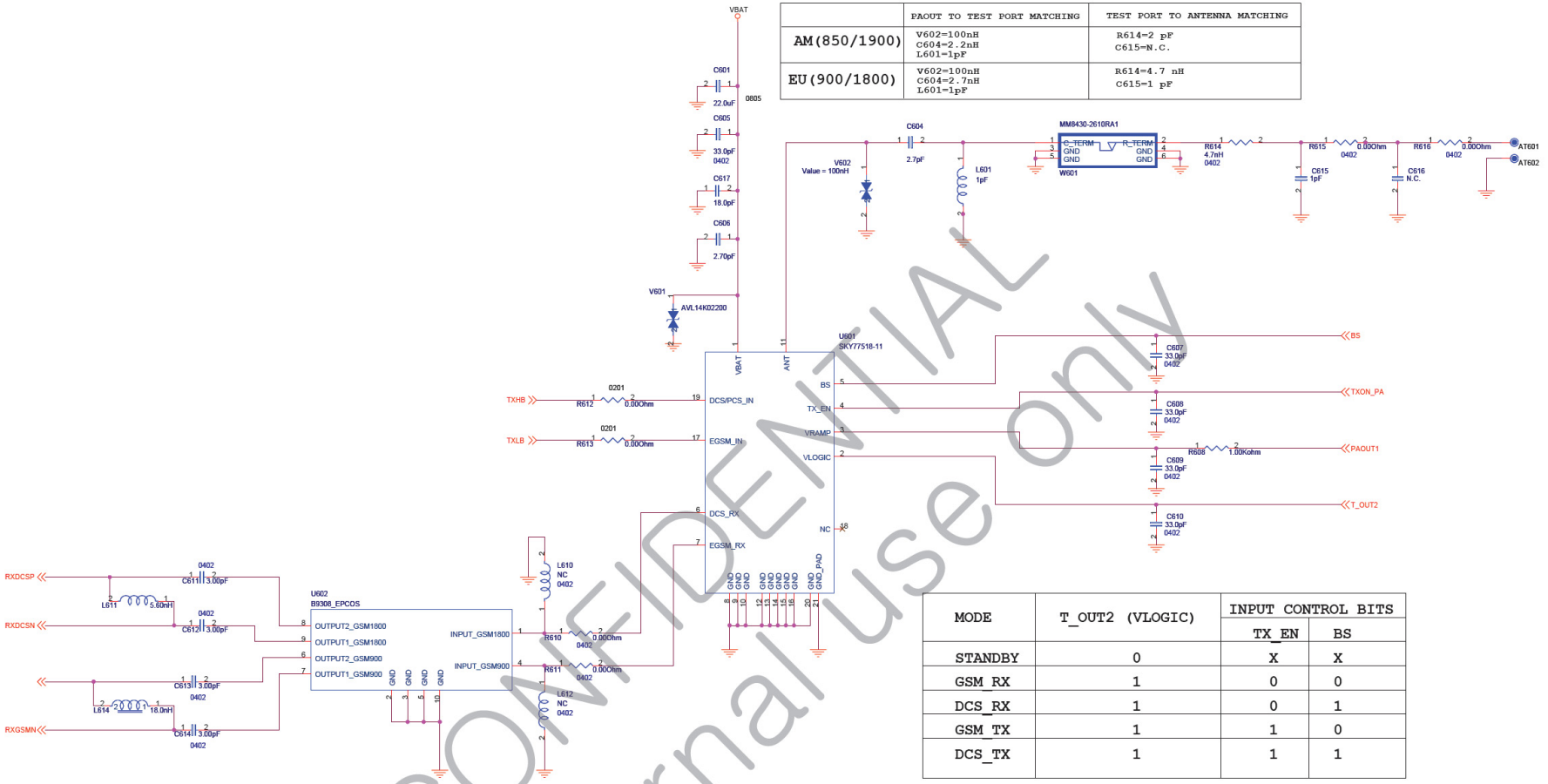
VIBRATOR



CHARGING IC

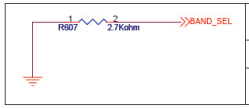


CONFIDENTIAL
Internal use Only



	PAOUT TO TEST PORT MATCHING	TEST PORT TO ANTENNA MATCHING
AM(850/1900)	V602=100nH C604=2.2nH L601=1pF	R614=2 pF C615=N.C.
EU(900/1800)	V602=100nH C604=2.7nH L601=1pF	R614=4.7 nH C615=1 pF

MODE	T_OUT2 (VLOGIC)	INPUT CONTROL BITS	
		TX_EN	BS
STANDBY	0	X	X
GSM_RX	1	0	0
DCS_RX	1	0	1
GSM_TX	1	1	0
DCS_TX	1	1	1



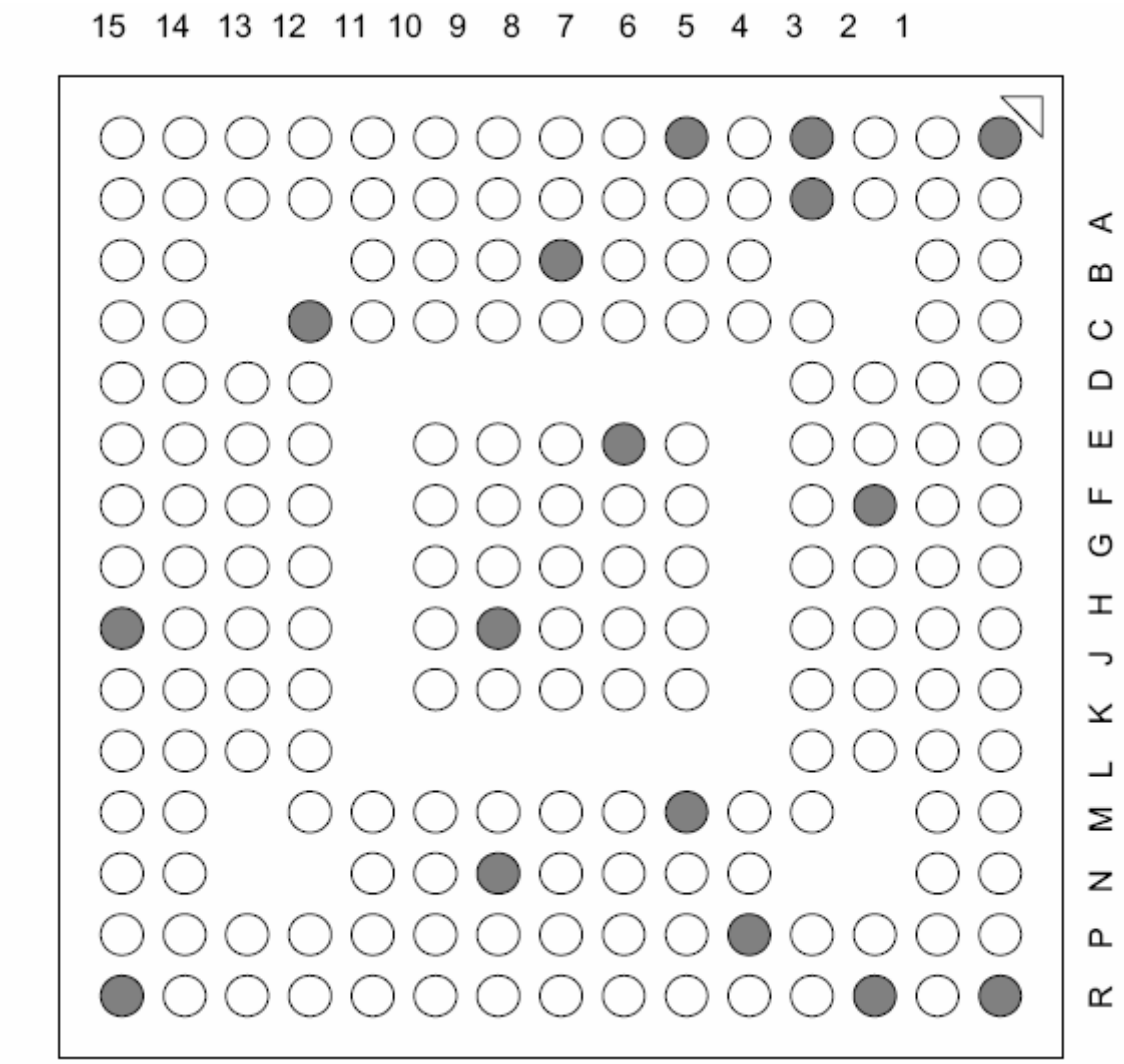
	BAND_SEL
AM(850/1900)	27K
EU(900/1800)	2.7K

CONFIDENTIAL
Internal use only

8. BGA IC PIN Check

BGA PIN Check of main chip

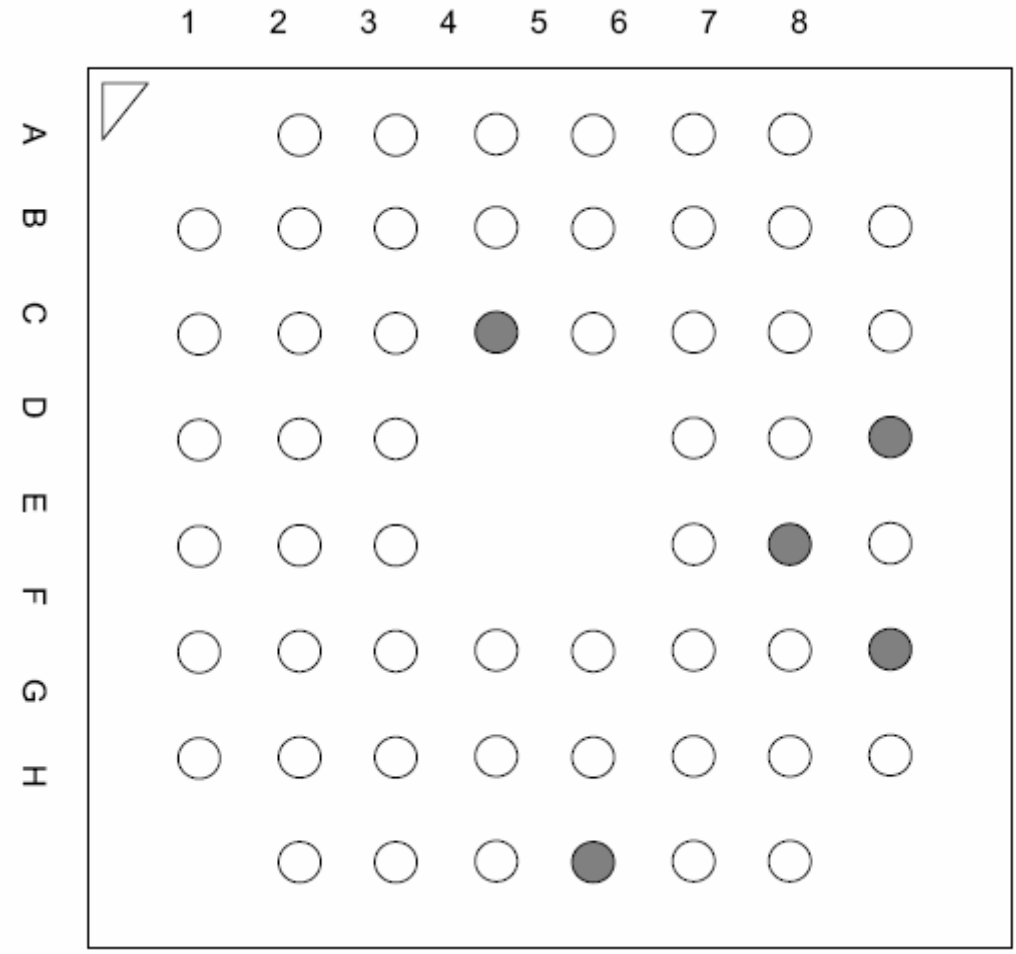
(Bottom view)



○ Use U101 Main chip (PMB7880)

● Not Use (EUSY0317401)

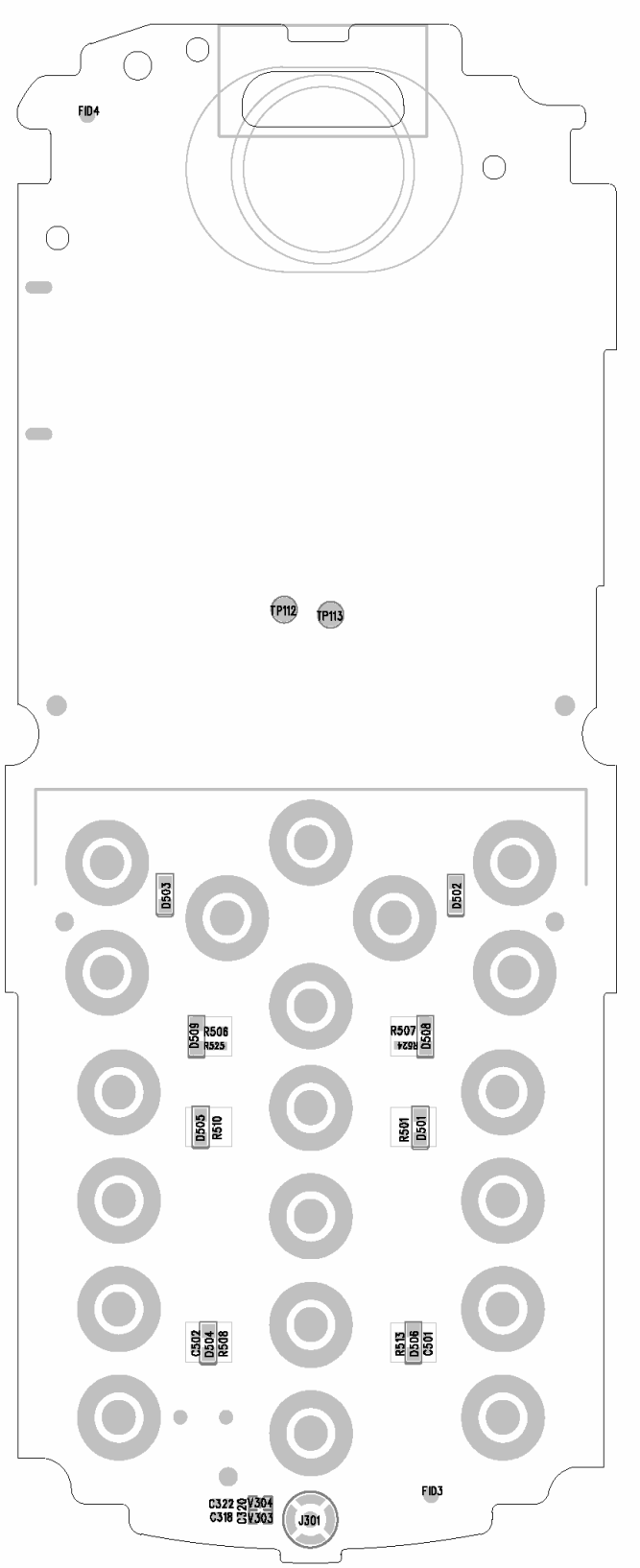
BGA PIN Check of Memory
(Top View)



○ Use U201 Memory (S71GL032N40BFW0P)

● Not Use (EUSY0328002)

9. PCB LAYOUT


FID4
TP112
TP113
D503
D502
D509
R508
R525
R507
R524
D508
D505
R510
R501
D501
C502
D504
R508
R513
D506
C501
C322
C318
C320
V304
V303
J301
FID3

U101 BB chipset(PMB7880)

No power on

No service etc

U601

PAM(SKY77518/SKY77517)

No TX & No RX

X6101 26MHz Crystal

No TX & No RX

J401 LCD Connector

No Display

U401 charging Pump

No Display

U201 Memory

No Booting

U505 Key LED TR switch

No LED

J201 SIM connector

No SIM

VIB501 Vibrator PAD

No Vibrator

U506 Vibrator TR switch

No Vibrator

U301 Speaker AMP

No Speaker

J501 I/O Connector

No Charging etc

X102 32.768KHz Crystal

No Booting

U304 FM Speaker AMP

No sound

(Speaker or Headset)

U303 FM Tuner

No FM radio

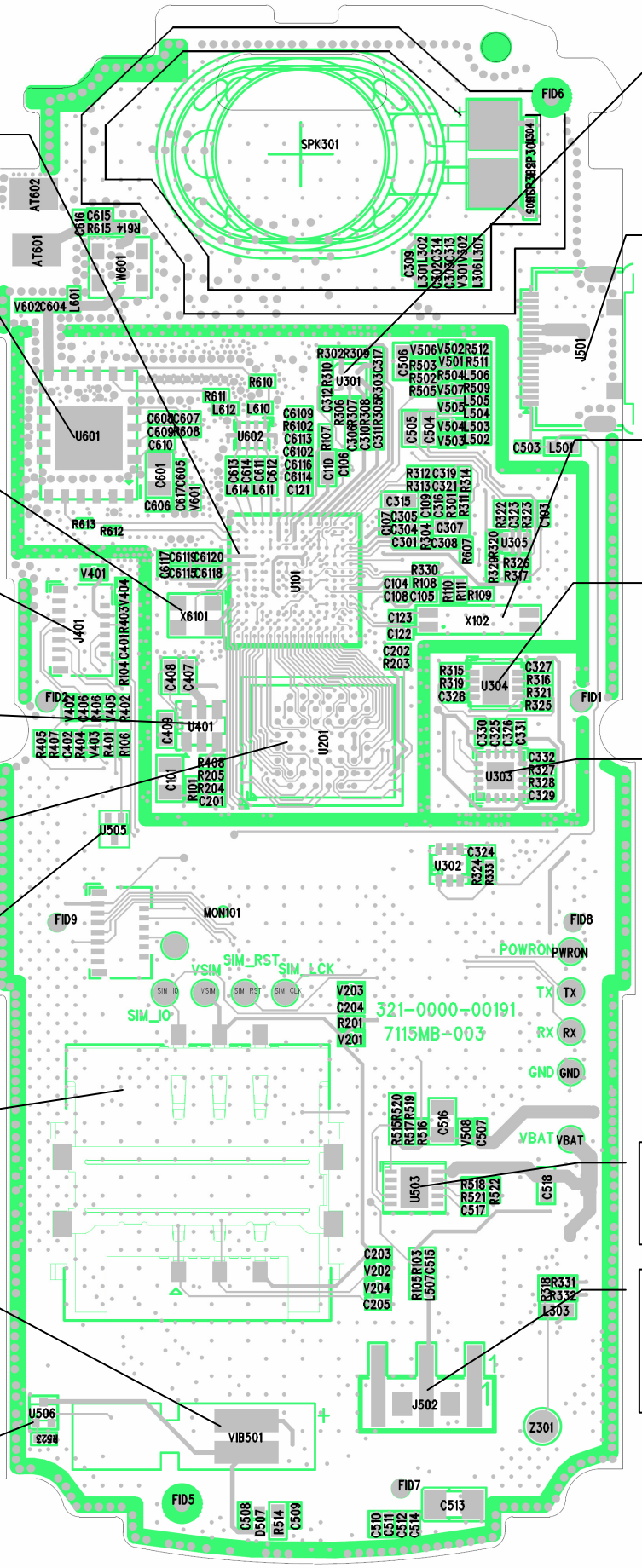
U503Charging IC

No Charging

J502 Battery Connector

No Charging

No Power On



10.Engineering Mode

1. Function Test

1.1 Test Purpose

To verify handset functional is pass or fail when assembled by visual check.

1.2 Test Facilities List

1.Battery
2.Earphone
3.Charger
4.GSM tester (4201S)
5.Battery Cover
6.FM transmitter

1.3 Test Procedure

1.3.1 Auto test sequence

1. Operator not need to insert test SIM card, and enter ”*8*” to check “auto test” as below.
2. When operator into function test mode, we just press “yes” key or “enter” key to into next test item.
3. When use auto test, every test item always turn on together.

No.	Test item	Verifying item
1	LCD	Display check (All white, all black, red, blue, green test) Every screen is 0.5 second
2	LED/Illumination +Vibrator+ Melody	Speaker and Melody function check (Always on/Set max volume)
		All Keypad LED
		Vibrator function check (Always on)
3	Keyboard + Receiver	All keys function check Method 1: screen shows all icons for key and operator press key one by one then it disappear in screen. Method 2: screen shows icon of key one by one then operator press it as phone instruction.
		Receiver check
4	Audio	Main Mic to Main Receiver audio loop check
5	Headsets (Earpiece)	Aux-Mic to Aux Receiver audio loop check
6	FM	Default handset in FM channel 100.7 MHz 1. Testing FM through headset (earpiece) 2. Testing FM through SPK
7	Antenna	Antenna circuit check by Radiation Power (Turn on GSM Power level 5 @ Ch40 for 900/1800 band Turn on GSM Power level 5 @ Ch190 for 850/1900 band)

1.3.2 Test mode for after download MMI

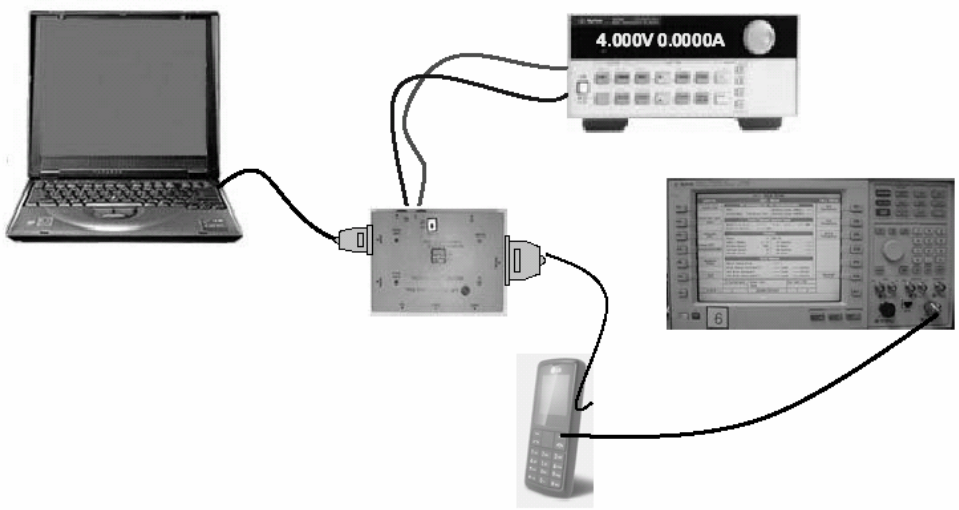
1.3.2.1 Service information Test

Operator not need to insert test SIM card, and enter"***" to check "Service information" as below.

Service information	
Test Conducted	**Verifying item**
IMEI:	Check IMEI number
Software version:	Read S/W Number & Version

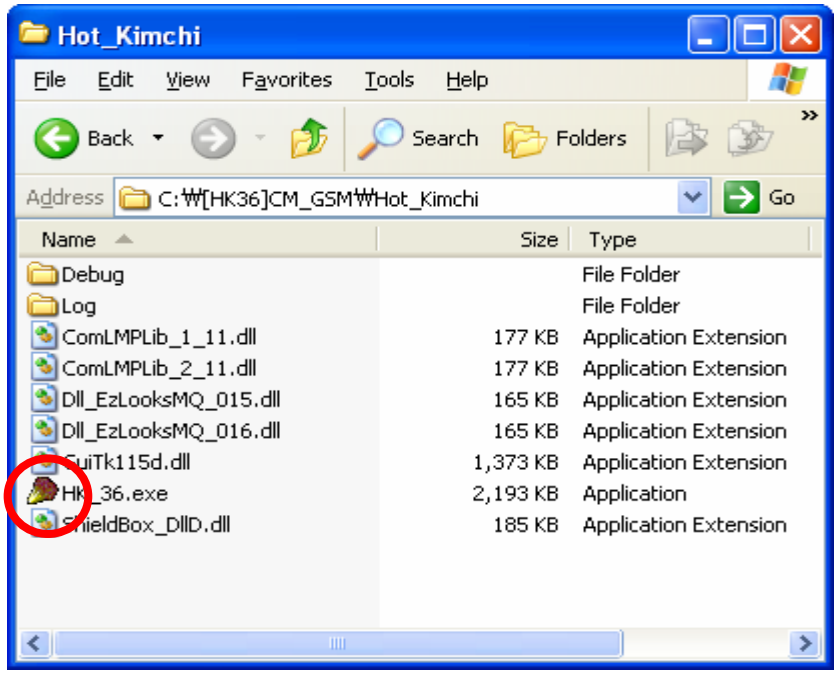
11.Calibration

11.1 Test equipment setup

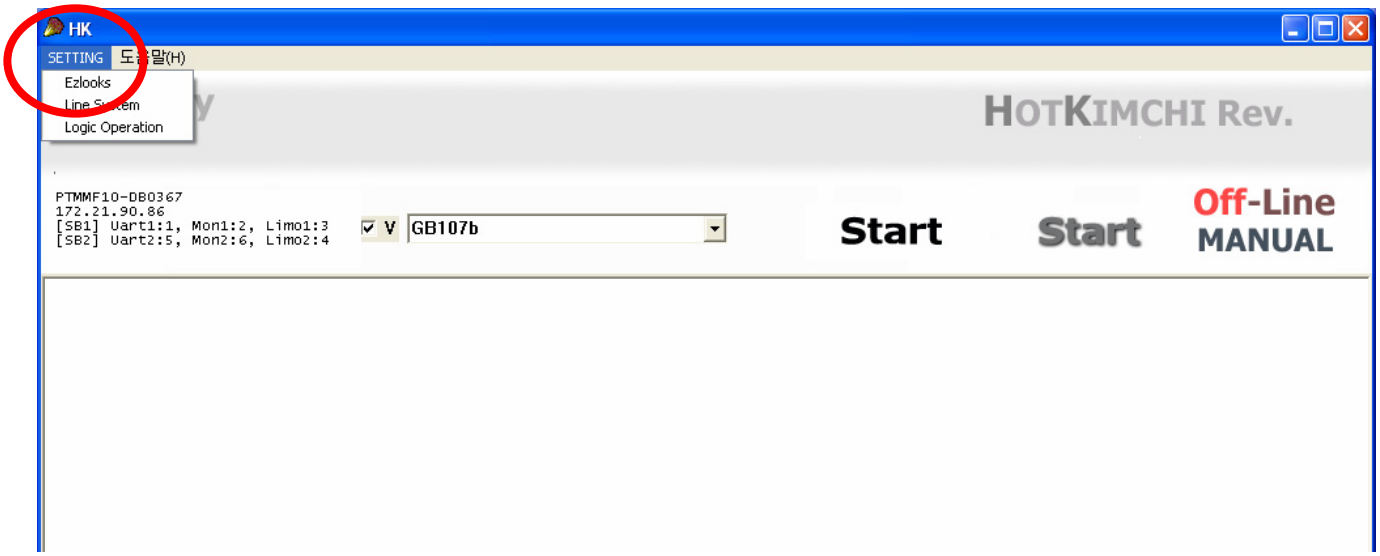


11.2 Calibration Steps

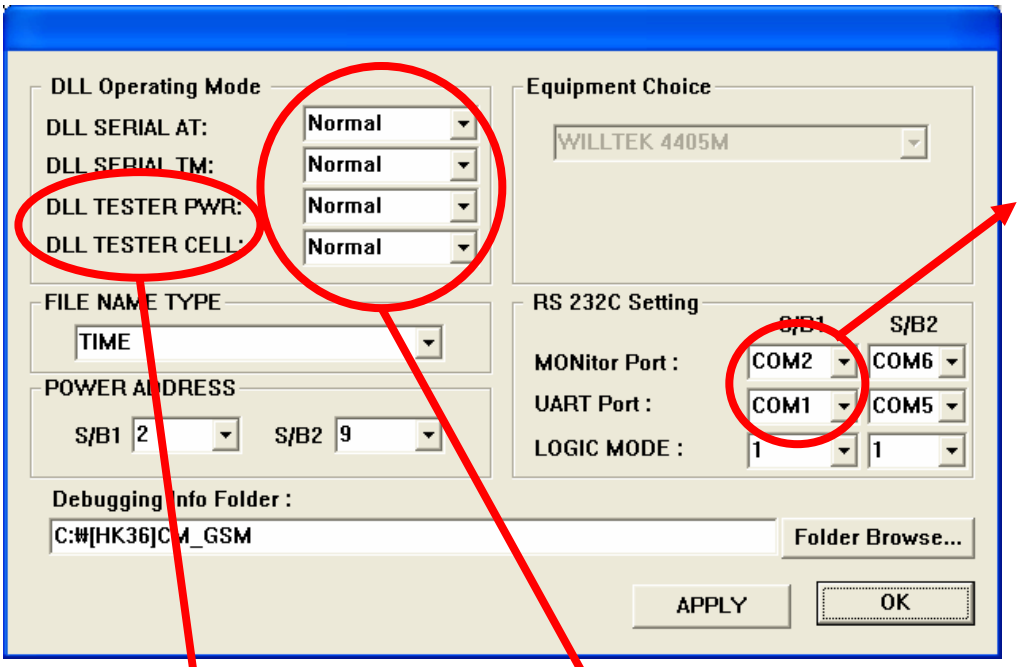
Execute “HK_36.exe”



Click “SETTING” Menu



Setup Logic operation such as the following figure



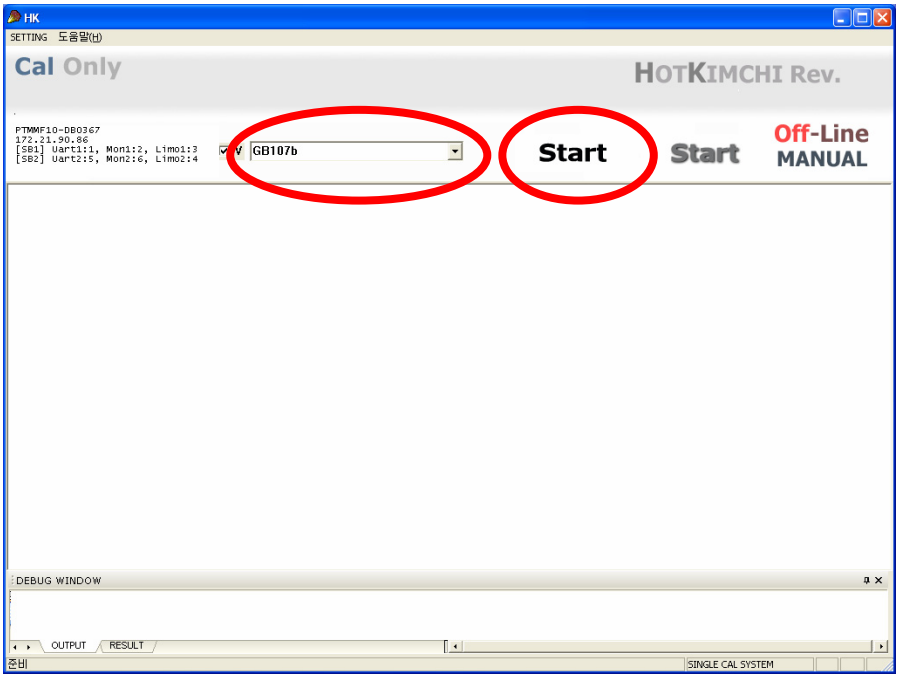
Setup UART Port

PWR : Power Supply
CELL :Call-Test Equipment

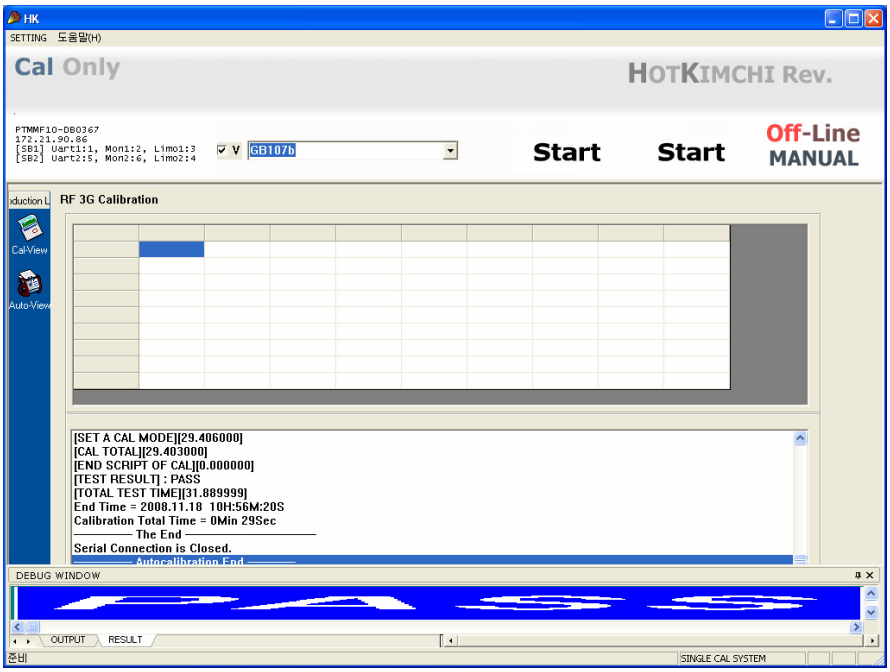
Operation Mode
1. By-Pass: not control by GPIB
2. Normal : control by GPIB

Select “MODEL”

Click “START” for RF calibration



RF Calibration finish



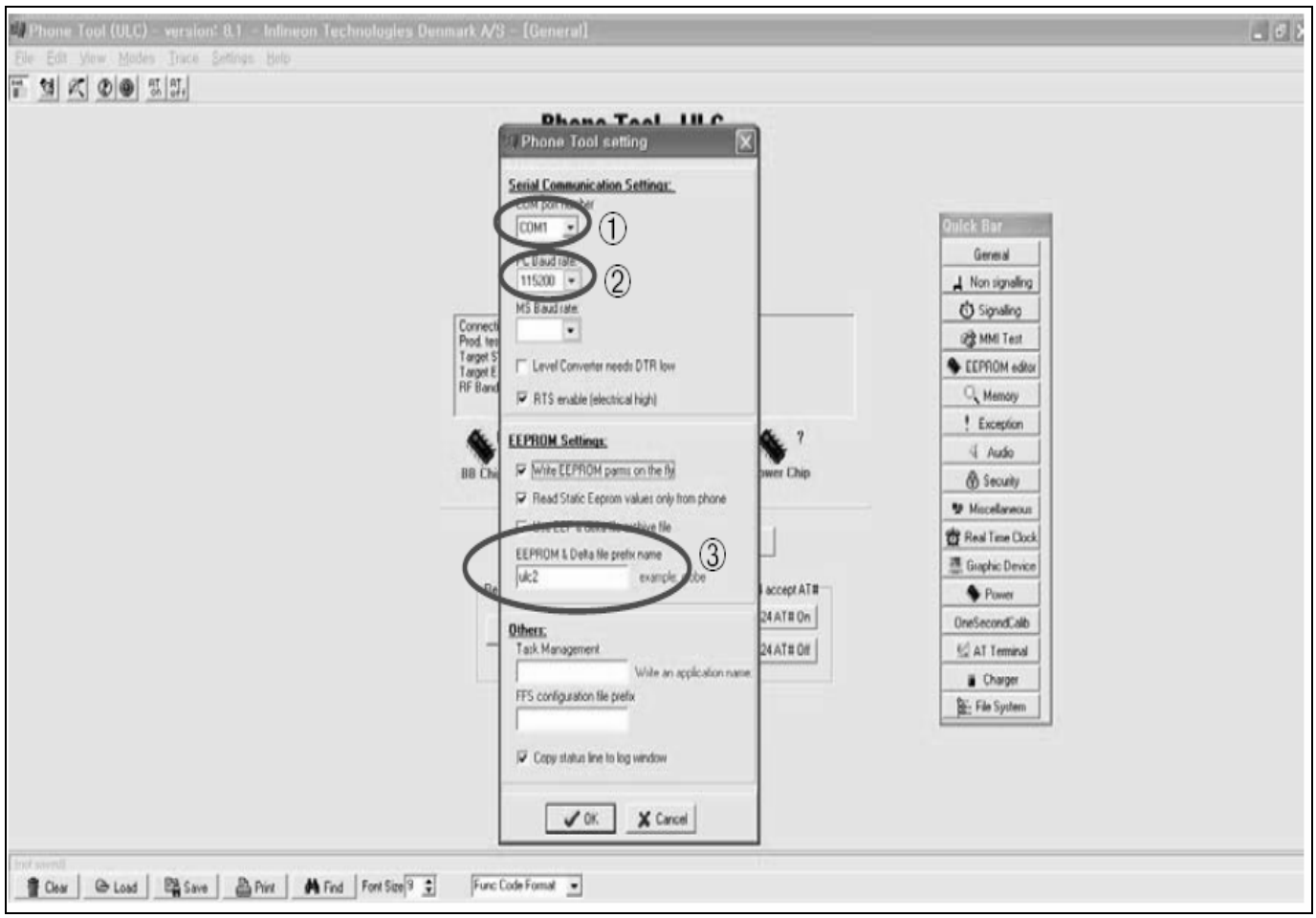
12. Stand alone test

12.1 Test program setting

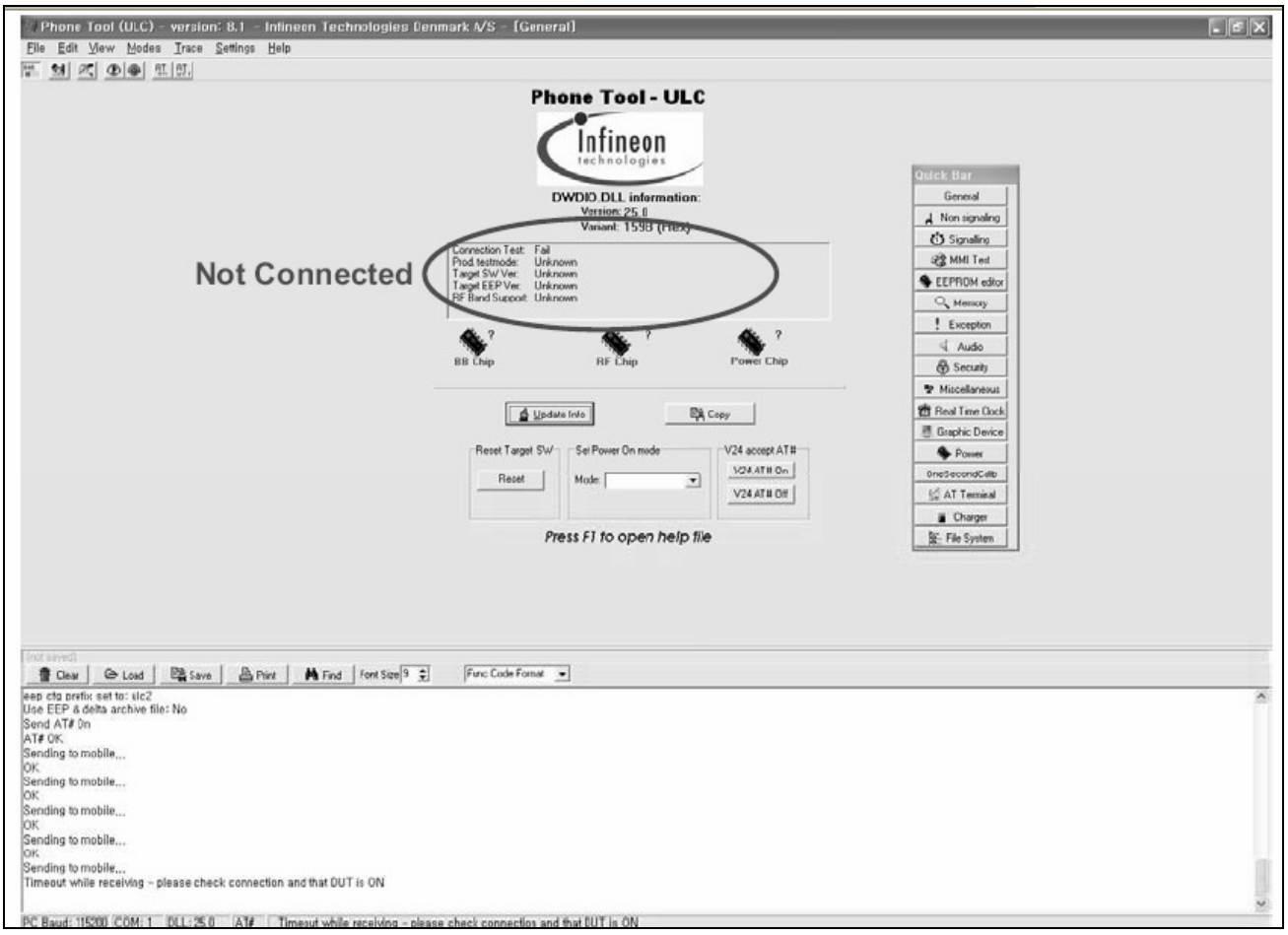
12.1.1 Set COM port

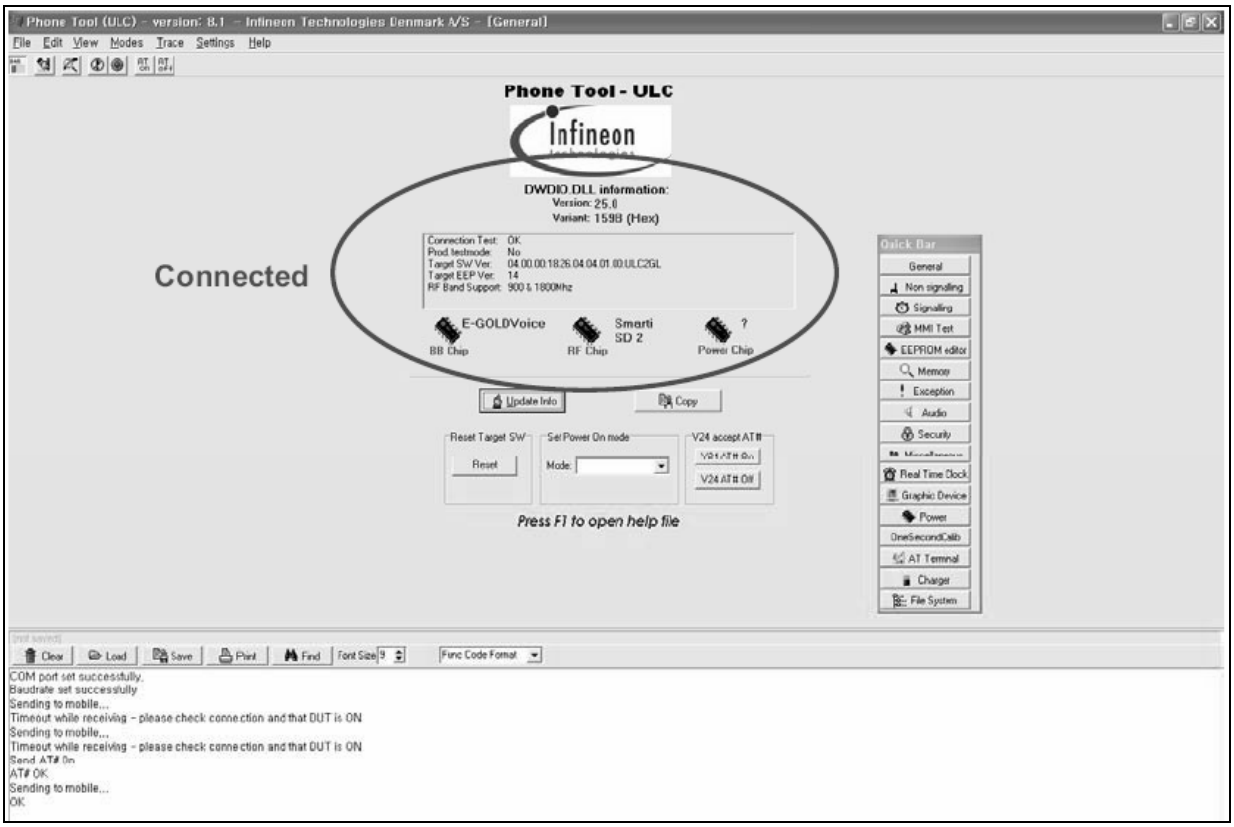
12.1.2 Check PC Baud rate (115200)

12.1.3 Confirm EEPROM &Delta file prefix name



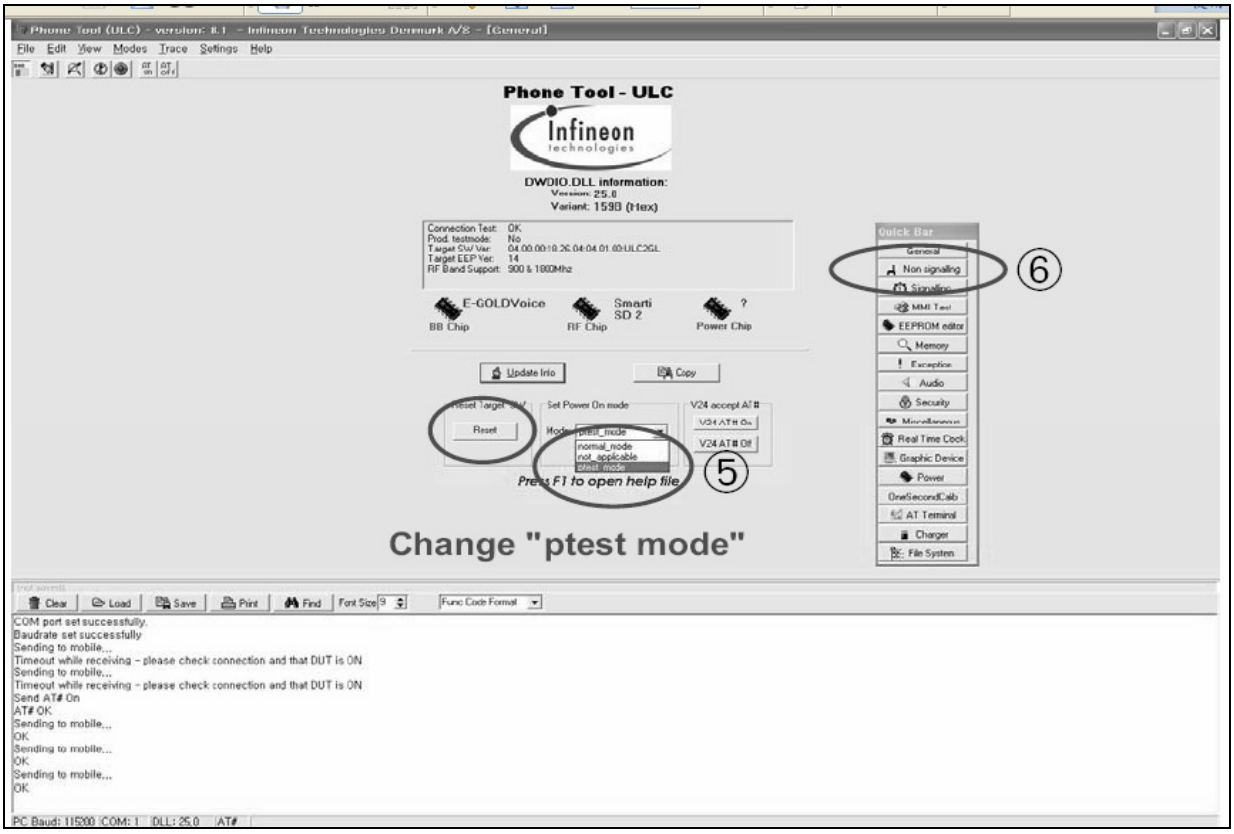
12.1.4 Press power on key, then click “V24AT#ON” and then “ Update Info” for communicating Phone and Test Program





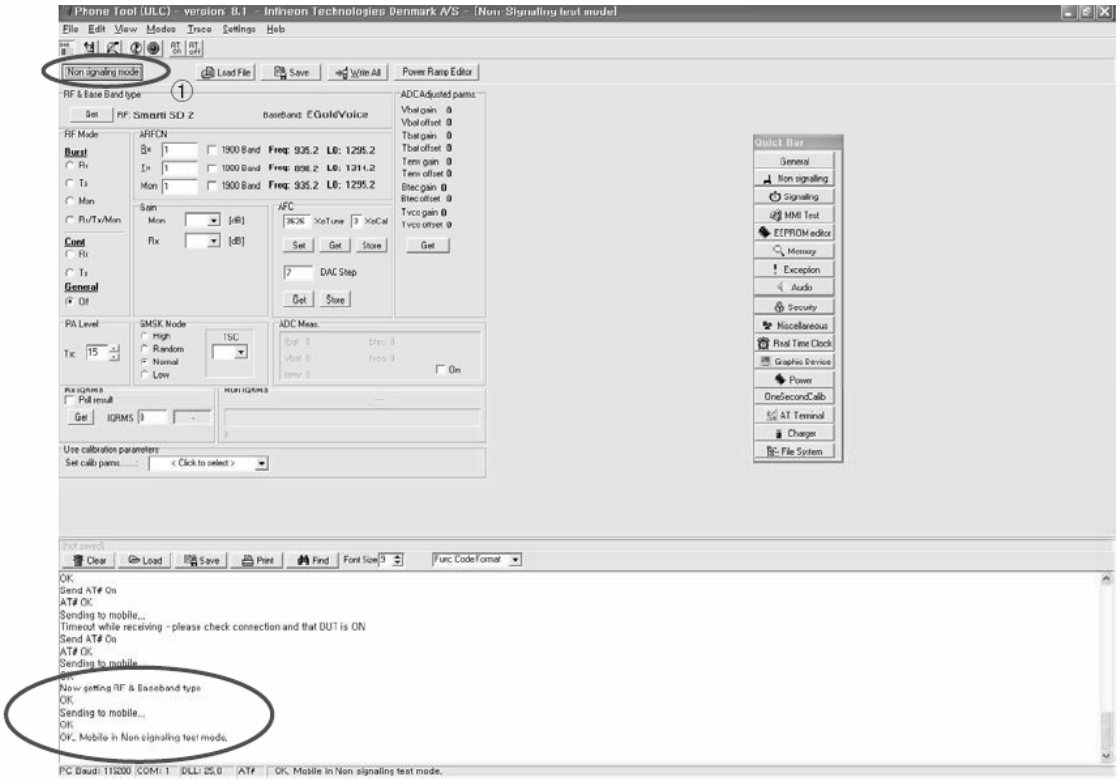
12.1.5 For the purpose of the Stand alone Test ,Change the phone to" ptest mode" and then click the " Reset" bar

12.1.6 Select "Non signaling" in the Quick Bar menu. Then Stand alone Test set up finished.



12.2 TX Test

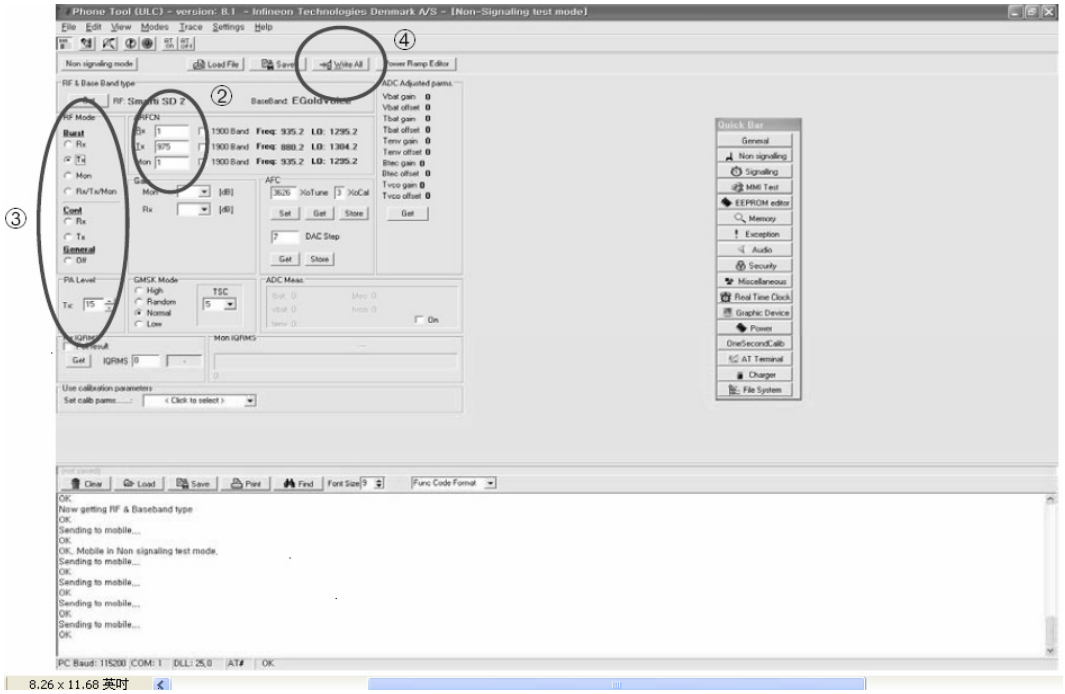
12.2.1 Click “Non signaling mode” bar and then confirm “OK” test in the command line.



12.2.2 Put the number of TX channel in the ARFCN.

12.2.3 Select “TX” in the RF mode menu and “PCL” in PA level menu .

12.2.4 Finally, Click “Write All” bar and try the efficiency test of phone.

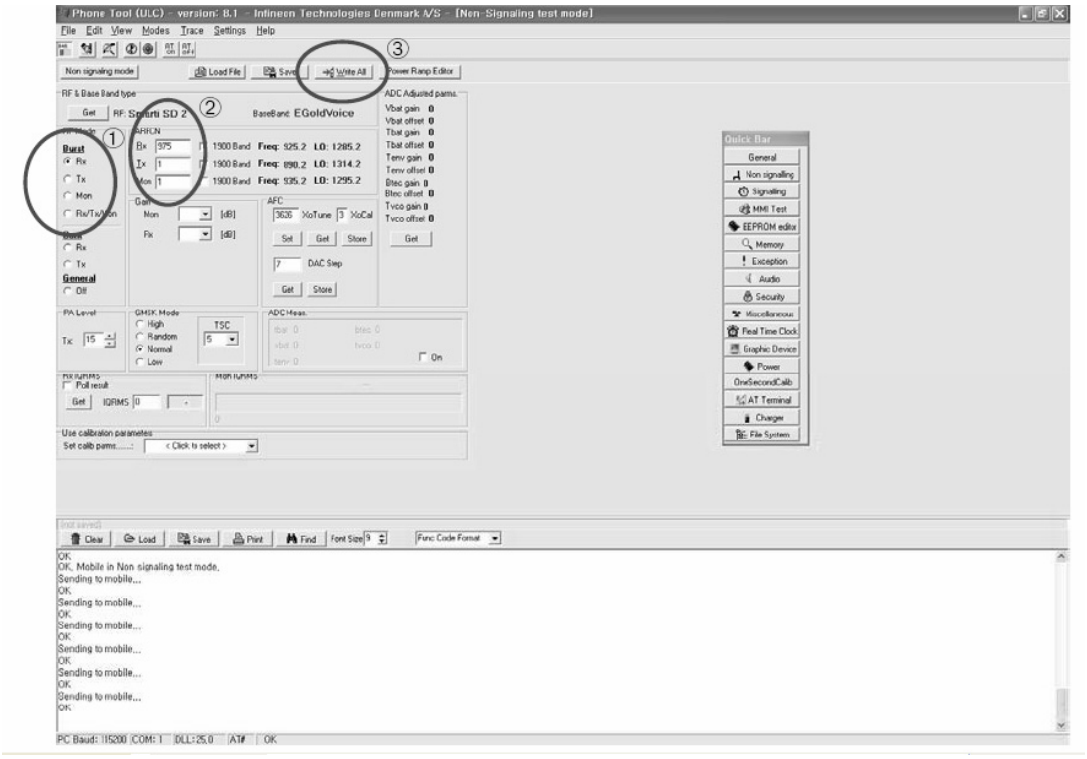


12.3 RX Test

12.3.1 Put the number of RX channel in the ARFCN.

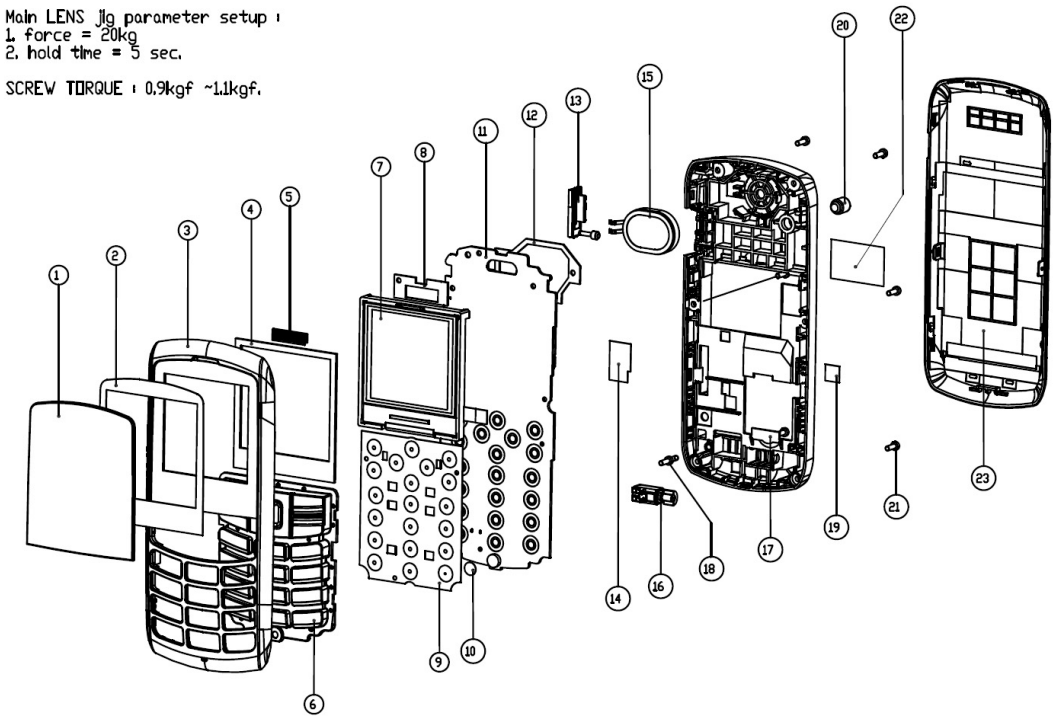
12.2.2 Select “RX” in the RF mode menu.

12.2.3 Finally, Click “Write All” bar and try the efficiency test of phone.



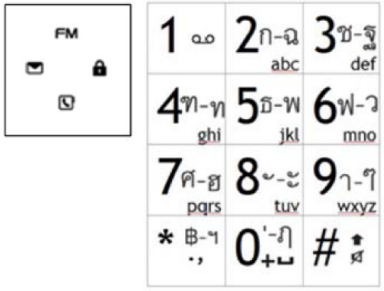
13. EXPLODED VIEW&REPLACEMENT PART LIST

13.1 Exploded View (GB106)



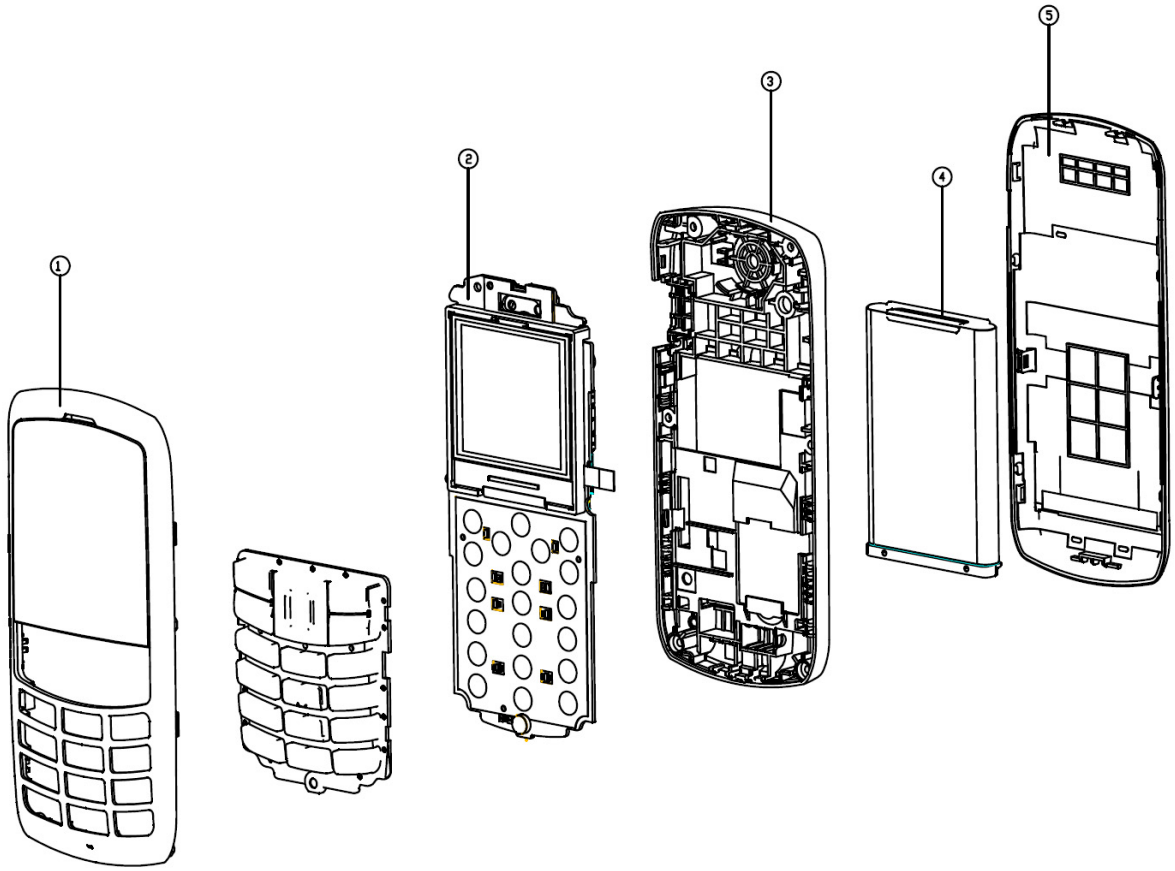
Main Lens

Keypad



NO	ITEM	Q'ty	ARIMA-Part No	LGE-Part No
23	Battery cover,FM ANT	1	405-71210-0001	ACGA0026901
22	IMEI Label (CE loge)	1	478-711500-001	MLAA0060501
21	Screw	6	409-00000-0068	GMZZ0027301
20	RF cover	1	405-71210-0003	MCCF0055901
19	Water dissolve label	1	478-721000-014	MTAB0271501
18	pogo pin FM	1	314-0000-00353	MCIA0020101
17	Rear cabinet	1	402-71220-0001	MCJN0093301
16	Vibrator	1	320-0000-00035	SJMY0009301
15	2 in 1 speaker	1	313-0000-00103	SUSY0028301
14	Mylar for LCM connector	1	415-71210-0012	MIDZ0191901
13	I/O cover	1	405-71210-0002	MCCC0060001
12	Sponge for speaker chamber	1	415-71210-0002	MPBN0063401
11	Main board	1	8PCB-7129-2-01	SAFF0235402
10	Mesh for microphone	1	415-71210-0003	MFBD0034601
9	Metal dome	1	415-71210-0004	ADCA0090301
8	Receiver sponge	1	415-71210-0006	MPBM0027001
7	LCD module	1	327-0000-00062	SVLM0032001
6	Keypad	1	404-71210-0007	MKAG0012911
5	Receiver mesh	1	415-71210-0011	MFBC0045401
4	Sponge for LCM	1	415-71210-0001	MPBG0084901
3	Front cabinet	1	401-71210-0001	MCJK0096501
2	Adhesive for main lens	1	415-71210-0005	MTAD0096301
1	Main lens	1	403-71210-0002	MWAC0109301

ASS'Y EXPLODE VIEW



NO	ITEM	Q'ty	ARIMA-Part No	LGE-Part No
5	Battery cover Sub-Ass'y	1	405-71210-0001	ACGA0026901
4	BATTERY PACK,LI-ION	1	306-0000-00060	SBPL0088801
3	Rear Cover Sub- Ass'y	1	402-71220-0001	ACGM0122603
2	PCB ASSY,MAIN	1	8-01-7129N0-01	SAFY0322102
1	Front Cover Sub-Ass'y	1	8M01-7121-E001	ACGK0124701

13.2 Replacement part list

GB106 SPPL

No.	Level	Location	LGE P/N	Ref Des	Maker Part Number	Description
1	3	ACGK00	ACGK0124701	COVER ASSY,FRONT	8M01-7121-E001	Front cover Ass'y (No.1~6)
2	4	MCJK00	MCJK0096501	COVER, FRONT	401-71210-0001	Front cover
3	4	MFBC00	MFBC0045401	Filter, Front, Speaker mesh for front cover	415-71210-0011	FILTER_7121_BLACK_PC_N/A_RECEIVER MESH_GUAN YI(WUJIANG)_FOR FRONT COVER
4	4	MPBG00	MPBG0084901	PAD, LCD, LCM poron Sponge	415-71210-0001	GASKET_7121_BLACK_PORON_N/A_LCM SPONGE_GUAN YI(WUJIANG)_SRS 32P,T=0.7mm
5	4	MTAD00	MTAD0096301	Main Lens Adhesive	415-71210-0005	ADHESIVE_7121_NoColor_ADHESIVE_N/A_MAIN LENS ADHESIVE_GUAN
6	4	MWAC00	MWAC0109301	Main Lens	403-71210-0002	Lens_7121_BLACK_PMMA_N/A_MAIN LENS_MILDEX(JIANGSU)_PMS BLACK C,FOR FM
7	3	ACGM00	ACGM0122603	COVER ASSY,REAR with Antenna Ass'y	402-71220-0001	Rear cover + Antenna protection tape + GSM Antenna (No.7~14)
8	4	MCCF00	MCCF0055901	RF cap (rubber)	405-71210-0003	Cover_7121_BLACK_SILICON_N/A_RF PLUG_ALL BLESSING_N/A
9	4	MCCC00	MCCC0060001	IO cover	405-71210-0002	Cover_7121_BLUE_TPE_Painting_IO COVER_ALL BLESSING_N/A
10	4	MCIA00	MCIA0020101	CONTACT,ANTENNA	314-0000-00353	Pogo Pin connector for FM Intenna
11	4	MCJN00	MCJN0093301	COVER,REAR	402-71220-0001	Rear cover
12	5	MTAC00	MTAC0077601	TAPE,SHIELD		Antenna protection tape
13	5	SNGF00	SNGF0042701	ANTENNA,GSM,FIXED		GSM Antenna
14	4	MTAB00	MTAB0271501	Water Protection Label	478-721000-014	WATER DISSOLVE LABEL_Mech. Label_7210_Global_WATER PROOF LABEL_N/A_E-
15	3	SJMY00	SJMY0009301	Vibrator Bar Type	320-0000-00047	Vibrator Bar Type_Y0408A-400350303-0021a_R2.25+4.40*4.60*13.40mm_LNLON_Spring contact type
16	3	SVLM00	SVLM0032001	LCD MODULE	327-0000-00062	1.5' , 65K color, LCD MODULE
17	3	GMZZ00	GMZZ0027301	Screw	409-00000-0068	Machine Screw_Flat_Cross(JCIS)_1.4mm_4mm_BLACK_Steel_Plating Zinc_HNS_NYLOK
18	3	MCJA00	ACGA0026901	COVER ASSY, BATTERY	405-71210-0001	GB106 Battery cover Ass'y (Battery cover with FM intenna)
19	3	MIDZ00	MIDZ0191901	LCM Connector Protection tape	415-71210-0012	SHEET_7121_BLACK_PET_N/A_MYLAR FOR LCM CONN_GUAN YI(WUJIANG)_N/A
20	3	MKAG00	MKAG0012908	Keypad, GB105/106 TN, English (Latin	404-71210-0001	Keypad, GB105/106 Titanium, English (Latin America) ,
20	3	MKAG00	MKAG0012902	Keypad, GB105/106 TN, Hindi	404-71210-0002	Keypad, GB105/106 Titanium, Hindi
20	3	MKAG00	MKAG0015702	Keypad, GB105/106 BK, Hindi	404-71210-0020	Keypad, GB105/106 Black, Hindi
20	3	MKAG00	MKAG0012913	Keypad, GB105/106 TN, Russian	404-71210-0003	Keypad, GB105/106 Titanium, Russian
20	3	MKAG00	MKAG0015701	Keypad, GB105/106 BK, Russian	404-71210-0021	Keypad, GB105/106 Black, Russian
20	3	MKAG00	MKAG0012914	Keypad, GB105/106 TN, Arab	404-71210-0004	Keypad, GB105/106 Titanium, Arab
20	3	MKAG00	MKAG0012915	Keypad, GB105/106 TN, Farsi	404-71210-0017	Keypad, GB105/106 Titanium, Farsi
20	3	MKAG00	MKAG0012911	Keypad, GB105/106 TN, Thailand	404-71210-0007	Keypad, GB105/106 Titanium, Thailand
20	3	MKAG00	MKAG0012910	Keypad, GB105/106 TN, English	404-71210-0008	Keypad, GB105/106 Titanium, English
21	3	MLAA00	MLAA0062001	Label	478-711500-001	GB106 IMEI label
22	3	SAFY00	SAFY0322102	PCB ASSY,MAIN, Thailand	8-01-7129N0-01	Main Board Ass'y_GB106 THATN, THABK (No.22 ~ 56)
23	3	MIDZ00	MIDZ0191901	LCM Connector Protection tape	415-71210-0012	SHEET_7121_BLACK_PET_N/A_MYLAR FOR LCM CONN_GUAN YI(WUJIANG)_N/A
24	5	MPBM00	MPBM0027001	RECEIVER FILTER_SPONGE+MESH	415-71210-0006	FILTER_7121_BLACK_FELT MESH_N/A_RECEIVER FILTER_GUAN
25	5	MPBN01	MPBN0063401	SPEAKER VOLUME SPONGE	415-71210-0002	GASKET_7121_BLACK_PORON_N/A_SPEAKER VOLUME SPONGE_GUAN
26	5	ADCA00	ADCA0090301	DOME ASSY,METAL	415-71210-0004	DOME_7121_NoColor_STAINLESS STEEL_N/A_METAL DOME_PRINTEC_N/A
27	5	J301	SUMY0012301	Microphone	312-0000-00040	Omni-MIC._SOM4013S-Z422-C3310_58 'dB - 42dB_± 2.0dB_Φ4.0*1.30mm_NA_SMD
28	5	MFBD00	MFBD0034601	Microphone Mesh	415-71210-0003	FILTER_7121_BLACK_FELT MESH_N/A_MIC MESH_GUAN YI(WUJIANG)_N/A
29	5	SUSY00	SUSY0028301	Speaker	313-0000-00103	LOUD SPEAKER_YD-1813QT_13 * 18 mm_8 Ohm_95.0dB_CHANG ZHOU YU CHENG_± 3dB,
30	5	D501	EDLH0015001	LED	309-0000-00021	LED Single Color_LTST-C193TBKT-5A_BLUE_2pin_0603_5mA/18~28mcd_LITEON_Luminous Bin
31	5	D502	EDLH0015001	LED	309-0000-00021	LED Single Color_LTST-C193TBKT-5A_BLUE_2pin_0603_5mA/18~28mcd_LITEON_Luminous Bin
32	5	D503	EDLH0015001	LED	309-0000-00021	LED Single Color_LTST-C193TBKT-5A_BLUE_2pin_0603_5mA/18~28mcd_LITEON_Luminous Bin
33	5	D504	EDLH0015001	LED	309-0000-00021	LED Single Color_LTST-C193TBKT-5A_BLUE_2pin_0603_5mA/18~28mcd_LITEON_Luminous Bin
34	5	D505	EDLH0015001	LED	309-0000-00021	LED Single Color_LTST-C193TBKT-5A_BLUE_2pin_0603_5mA/18~28mcd_LITEON_Luminous Bin
35	5	D506	EDLH0015001	LED	309-0000-00021	LED Single Color_LTST-C193TBKT-5A_BLUE_2pin_0603_5mA/18~28mcd_LITEON_Luminous Bin
36	5	D507	EDSY0018501	Diode	309-0000-00111	Diode Schottky_SDM20U40-7_N/A_2pin_SOD-523_250mA/40V_DIODES_N/A
37	5	J201	ENBY0048401	SIM card Connector	314-0000-00382	CON. SIM CARD CONNECTOR_SIM-06HB3G_2.540 mm_6 pin_OCTEKCONN_H=1.65mm
38	5	J401	ENBY0048501	FPCB coneector	314-0000-00358	CON. FPC CONNECTOR_FH26W-13S-0.3SHW(05)_0.600 mm_13 pin_HIROSE_H=1.0mm
39	5	J501	ENBY0048601	MMI 18pin Connector	314-0000-00283	CON. I/O FEMALE CONNECTOR_HSEJ-18S04-25R_0.400 mm_18 pin_HANSHIN_H=2.5mm
40	5	J502	ENBY0048701	Battery Connector	314-0000-00337	CON. BATTERY CONNECTOR_BTP-03QE4G_3.000 mm_3 pin_OCTEKCONN_H=5.75 mm,Snap
41	5	W601	ENBY0048801	RF CONNECTOR WITH SWITCH	314-0000-00070	CON. RF CONNECTOR WITH SWITCH_MM8430-2610RA1_3.000 mm_6 pin_MURATA_N/A
42	5	U505	EQBP0011201	IC, NPN Transistor	310-0000-00071	NPN Epitaxial Planar Transistor_PDTC143ZE_3pin_SOT-416_PHILIPS_R1=4.7K, R2=47K
43	5	U506	EQBP0011301	IC, MOSFET	310-0000-00037	N Channel-MOSFET_NTA4153NT1G_3pin_SC-75_ON SEMI_20V/915 mA
44	5	U101	EUSY0376501	IC, BaseBand	311-0000-00637	I.C BASEBAND PROCESSOR_PMB7880_BGA_189 BALLS_NoMemory_INFINEON_N/A
45	5	U201	EUSY0376601	IC, MCP	311-0000-00638	I.C FLASH MEMORY_S71GL032N40BFW0P0_FBGA_56 BALLS_32M+4M_SPANSION_FLASH +
46	5	U301	EUSY0376701	IC, FM Module	311-0000-00673	I.C FM MODULE_SI4702-C19-GMR_QFN_20 PINS_NoMemory_SILICON LABS_N/A
47	5	U303	EUSY0376801	IC, Audio Power Amp	311-0000-00689	I.C AUDIO POWER AMPLIFIER_TPA6202A1ZQVR_BGA_8 Balls_NoMemory_TI_Vo=3.6V, 0.63 W,
48	5	U304	EUSY0377001	IC, Stereo audio power amp	311-0000-00676	I.C STEREO AUDIO POWER AMPLIFIER_TS486-IQT_DFN_8 PINS_NoMemory_ST_Po=3.3V,16
49	5	U305	EUSY0377101	IC, Analog Switch, Dual SPDT	311-0000-00631	I.C ANALOG SWITCH_STG5223QTR_QFN_10 PINS_NoMemory_ST_DUAL SPDT
50	5	U401	EUSY0377201	IC, DC-DC converter	311-0000-00633	I.C DC-DC CONVERT_MP9361DJ-LF-Z_TSOT-23_6 PINS_NoMemory_MPS_N/A
51	5	U503	EUSY0377301	IC, Charge	311-0000-00632	I.C CHARGE_MP26021DQ-LF-Z_QFN_10 PINS_NoMemory_MPS_FOR Li-ion BATTERY,2.8V/1A
52	5	U601	EUSY0377501	I.C POWER AMP MODULE(RF)	311-0000-00028	I.C POWER AMP MODULE(RF)_SKY77518-11_MCM_20 PINS_NoMemory_SKYWORKS_6*8*1.2mm
53	5	X102	EXSY0023601	Crystal Ocsillator, 32.768KHz	305-0000-00021	Crystal Ocsillator_Q-SP17P0327620C5GL_32.768KHZ_±20ppm_SMD-7*1.5mm-4Pin_SII_CL=12.5pF
54	5	X6101	EXSY0023701	Crystal Ocsillator, 26MHz	305-0000-00069	Crystal Oscillator_EXS00A-CS00030_26.0 MHZ_±8.0ppm_SMD-3.2*2.5mm-4Pin_NDK_NX3225SA
55	5	MCBA00	MCBA0043901	SHIELD CAN, Cover and Frame	415-71210-0007	SHIELD CAN, Cover and Frame
56	5	U602	SFSY0038501	Saw Filter	326-0000-00117	Filter_SAW_B39182B9308G110_GSM 900 & 1800 2in1_EPCOS_FOR GSM RX,50/150 OHM-SMD10PIN
57	3	SBPL00	SBPL0088801	BATTERY PACK,LI-ION	306-0000-00060	Li-ion Battery Cell Packing_3.7V_950mAh
58	3	SGEY00	SGEY0003213	EAR PHONE/EAR MIC SET	333-0000-00058	Headset Stereo Channel Type
59	3	SSAD00	SSAD0028101	ADAPTOR,AC-DC	331-0000-00095	Travel adapter for North America, Thailand,
59	3	SSAD00	SSAD0028201	ADAPTOR,AC-DC	331-0000-00098	Travel adapter for Europe , Turkey, U.A.E. ,
59	3	SSAD00	SSAD0028401	ADAPTOR,AC-DC	331-0000-00094	Travel adapter for India
59	3	SSAD00	SSAD0028501	ADAPTOR,AC-DC	331-0000-00097	Travel adapter for Russia, CIS, Singapole, Malaysia